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Research Article

The Value of a Pilot Study in Educational Research Learning: In Search of a Good Theory-Method Fit

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Abstract

This article shares the authors' reflections and experiences gained from a pilot study that was recently used in completing a larger qualitative educational research study on the challenges and opportunities for instructional leadership in inclusive secondary schools in Zimbabwe. Historically, pilot studies have not been reported. When interest in this area started to emerge, the focus was on quantitative research, especially in health-related disciplines. In recent times, there has been growing debate on the place of pilot studies in qualitative and mixed methods research. However, a number of questions still remain unanswered, especially in the area of educational research. One of the worrisome features of these questions seems to be the taken-for-granted assumption that once a researcher conceives of an educational research idea, they are automatically clear and specific on the onto-epistemological and methodological tools that may best be employed to answer the questions at hand. This view is reflected when, for example, the few writers on pilot studies generally specify a particular research approach, such as importance of pilot studies in quantitative research, importance of pilot studies in qualitative research, or importance of pilot studies in mixed methods research, and do not talk about the value of a pilot study in educational research learning as a search for a good theory-method fit. This article focuses on pilot studies in educational research learning in order to close this gap. The central theme in this article is that pilot-studying may itself determine, for example, whether a study should follow a qualitative, mixed methods or quantitative approach. It also determines the appropriateness of research tools for the task at hand. Specifically, pilot-studying helps especially student researchers to find an appropriate theory-method fit and thereby makes researching possible. Following a pilot study, educational research that was originally planned to be mixed methods research or quantitative research may end up embracing a qualitative approach and vice versa. Our desire to share reflections and experiences gained in completing the main PhD study which informs the current article, coupled with ongoing debates on pilot studies in educational research, inspired us to pen this article. The article contributes to scholarship by elaborating and adding new insights on the work of earlier writers on the important research practice of pilot-studying in educational research processes.

Keywords: *Educational research, good theory-method fit, pilot study, reflections and experiences, research on research, student researchers*

1. Introduction

Many questions remain unanswered concerning the role of pilot studies in human science research such as in educational research (Fraser et al., 2018). However, these questions seem to reflect more on novice researchers than they do on established researchers (Harding, 2013; Krathwohl, 2009). Jane (2014), for example, asked questions on whether a pilot study is necessary if research instruments were validated by an expert in the field of study. In an apparent support to these types of questions, Ismail et al. (2018) asked whether a pilot study really matters, in the first place. In a similar vein, Graser (2019) asked: "Does anyone know a journal that publishes protocols of pilot studies (except from 'bmc – pilot and feasibility studies')?" Clearly, these questions show a gap in researchers' understanding of the value of pilot studies in human science research, including in education. In support of this view, Aziz and Khan (2020) observed: "As far as the use of pilot study is concerned, literature is under-discussed, underused and under-reported" (p. 751). Similarly, Malmqvist et al. (2019) said, "… conducting and reporting on pilot studies is a neglected part of the research process" (p. 4). This view is also shared by Kim (2010), who admitted that historically, "[p]ilot studies have attracted limited attention in research literature" (p. 191). In light of this discrepancy (Schachtebeck et al., 2017) and in the backdrop of a seemingly youthful, but important, debate on the place of pilot studies in human science research, Doody and Doody (2018) advocated for pilots to be more widely discussed and experiences from such studies more widely disseminated. In the same vein, Dzwigol (2020) saw a pilot study as an integral part of a research procedure. Talking specifically about educational research, Fraser et al. (2018) encouraged researchers in this field to also report and discuss pilot studies, focusing not only on the processes involved, but also on the benefits accrued. This call has also been echoed by Cope (2015). The discrepancy in pilot studies, as literature has shown, coupled with our conviction that as researchers, we have an ethical and scientific obligation to share information and help other researchers to make the most of our resources, consumed us and created a strong desire to pen an article which seeks, in part, to close the identified gap.

2. Background and Purpose of the Article

This article shares the authors' reflections and experiences gained through a pilot study that was recently used in completing a larger qualitative educational study on the challenges and opportunities for instructional leadership in inclusive secondary schools in Zimbabwe as perceived and experienced by school heads in this instructional environment. Whereas there is consensus among many writers that pilot-studying is important (Ismail et al., 2018), very few sources directly report on pilot studies in human sciences research, including in education (Janghorban et al., 2014; Kim, 2010; Williams-McBean, 2019). Most of the literature available in this area involves brief sections in completed theses and dissertations (Gudmundsdottir & Brock-Utne, 2010). Stand-alone articles on pilot studies have only been a recent feature (Schachtebeck et al., 2017). Pratt and Yezierski (2018) supported this view and further attested that published results from pilot studies may be obtained in literature by coincidence, as research designs in most educational studies are generally not intended to report on methodological issues such as involved in pilot studies. Aziz and Khan (2020) thus confirmed this discrepancy in saying, "[a]s far as the use of pilot study is concerned, literature is under-discussed, underused and under-reported" (p. 751). Malmqvist et al. (2019) also supported this observation in saying, "When pilot studies are found in research publications, they are seldom discussed in-depth, with few detailed descriptions of how they were conducted and how the main study was adapted in terms of changes of procedures, instruments, and other management issues" (p. 4) as a result of the pilot studies. Clearly, as literature has shown, there is a general agreement among writers that, though important, conducting and reporting on pilot studies is a generally neglected part of the research process. Many writers attribute this discrepancy to the youthful nature of the field of "meta-research" (Peterson & Panofsky, 2020), that is research on research in general and pilot-studying in particular. Others attribute it to "a tendency for journals to only accept for

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publication, papers that have statistically significant results" (Malmqvist et al., 2019, p. 5).

According to Ismail et al. (2018), with echoes from Crossman (2019) and Williams-McBean (2019), pilot-studying is more a feature of quantitative studies, especially in the areas of health- and nursing-related issues, than qualitative studies. This observation further confirms that even as writers largely agree that pilot-studying is important (Doody & Doody, 2015; Hassan et al., 2006), there is generally a dearth (Schachtebeck et al., 2017) of detailed and systematic literature on pilot studies for reference by members of the academic community, especially within the area of educational research learning. In many studies that were reviewed in preparation for the main study to which this article refers (but which cannot be named in order to avoid undue criticism and in the interest of "intellectual humility" (Ioannidis, 2018), sections on pilot studies were written without much detail and reference to existing literature. This view is also supported by Van Teijlingen et al. (2002), who observed that most writers often claim having benefited from conducting a pilot study and making necessary adjustments to their original plans, but do so without presenting to readers the details of how exactly they benefited from such studies. The current article therefore seeks to bridge this gap.

Given the discrepancy as discussed in this section, and acknowledgement by many writers of the important but under-discussed benefits of pilot-studying, Malmqvist et al. (2019) opined that "the use of pilot studies needs to be more widely discussed and experiences from pilot studies disseminated [more widely] as these issues have ramifications on research quality" (p. 4). The general neglect of pilot studies, which, as Aziz and Khan (2020) and Sampson (2004) put it, is also characterised by under-reporting, under-utilisation and under-discussion of literature on this important aspect of the research process created in us a burning desire to share our experiences from the perspectives of a student researcher and a research supervisor (first and second authors of this article, respectively). Specifically, in this article, we seek to share our experiences and reflections on the value of pilot studies in education research as gained through practice. In so doing, we seek to contribute to scholarship through theory development and theory elaboration (Gehman et al., 2018). By education research, we mean research involving student researchers pursuing study programmes, such as PhD or research master's degrees in the field of education.

This article has three interrelated objectives. The first objective is to share experiences on how pilot-studying improves research processes for student researchers through its effect on concept mapping and issue refinement. The second objective is to illustrate how pilot-studying impacts on methodological issues in educational research learning. The third objective is to share experiences on how pilot-studying improves the quality of research by creating a good theory-method fit in educational research that involves student researchers (Gehman et al., 2018) and research supervisors. The grounding assumption in this article is that the realisation of the above objectives contributes to scholarship by adding voice to a youthful but promising discourse on meta-research in general and pilot study in particular and thus widens the stock of literature available for reference by fellow researchers in the academic community. The article shares the authors' experiences from the perspective of a student researcher doing research for learning purposes and from the perspective of a research supervisor guiding the student researcher through a potentially long, bumpy, winding and sometimes swampy road towards completing a PhD research programme. This article does not seek to report on how as researchers we went about the practice of pilot-studying. It also does not seek to report on the findings of the pilot study in relation to issues at stake in the main study to which it refers. We feel that such an approach has been used convincingly by earlier writers, as reported by Doody and Doody (2015) and Ismail et al. (2018). Sampson (2004), who described the research process as navigating the waves, also reported on many studies that focus on the how questions of pilot studies that were carried out by different researchers across the globe. Our article therefore seeks to build on the work of such earlier writers and contribute to scholarship by elaborating and adding new insights to existing literature on this key aspect of the research process by focusing on the benefits accrued and not on the processes involved. This is a dimension of pilot studies that to the best of our knowledge has not been fully explored. Specifically, this article reflects on adjustments made to the different elements of the main study as informed by lived experiences from the pilot study, and the

effects of these adjustments on successful completion of the PhD study by the student researcher.

Our article is structured as follows. First, it presents a brief review of the literature related to the concept and practice of pilot-studying in order to bring issues under discussion into perspective. This review is followed by a brief description of the pilot study conducted in preparation for the main study referred to in the article. The description is then followed by a presentation and discussion of lived experiences (Kelly et al., 2018; Lincoln et al., 2011) and reflections of the authors on how the pilot study shaped the main PhD study. Our discussion touches on the aspects to do with methodological issues and effects of pilot-studying on concept mapping and issue refinement. In addition, this discussion also touches on issues related to the adjustments made to the population of interest and research instruments, and to the onto-epistemological assumptions (Bansal et al., 2018) upon which the larger study is grounded. The final section takes readers through the personal reflections of the authors on the importance of researching on research (Ioannidis, 2018; Odigwe et al., 2020) in general and on pilot studies in particular. It also shows the role of pilot studies in helping student researchers to refocus their studies. These are researchers who are still grappling to establish their own methodological affiliations (Sampson, 2004) and they surely may need trial studies to guide them to establish a good theory-method fit (Gehman et al., 2018).

3. The Concept, Rationale and Practice of Pilot-Studying

The concept "pilot study" in human science research, including in education, can be used either in its narrow or broad sense (Polit & Beck, 2017) as comprising feasibility studies and pilot-testing of research instruments. Although this classification is sometimes contested by some writers with a quantitative orientation, especially from the nursing sciences (Eldridge et al., 2016; Williams-McBean, 2019), such as, is the case with Lowe (2019), the term pilot study in its narrow sense can be used to refer to feasibility studies. Specifically, these are "small scale version[s], or trial run[s], done in preparation for the major study" (Polit et al., 2001, p. 467). Secondly, it can be used to refer to trying out research instruments before the actual data collection process begins to unfold (Vogel & Draper-Rodi, 2017). It is in this context that it is also called "pilot-testing" (Lowe, 2019; Majid et al., 2017). In its broad sense, as also adopted in the current article, a pilot study refers to a combination of both feasibility studies and pilot-testing research instruments (Williams-McBean, 2019). In this broad perspective, pilot studies are viewed as small-scale studies that precede larger studies, with the aim of helping researchers to make improvements to the larger study, including research instruments.

Although they use different criteria for classification, Aziz and Khan (2020) also subscribed to the dichotomous view of pilot studies when saying, "pilot studying in academic research is viewed from two perspectives" (p.751), that is, from the perspective of the research process and from that of the researcher benefits. From the perspective of the research process, pilot-studying helps to refine the methodology of the main study (Schachtebeck et al., 2017). Ismail et al. (2018) thus saw pilot-studying as a method that is used to refine research questions, to figure out the best methods for pursuing such questions, and to estimate the time and resources that will be required to complete the larger version of the study. Castillo-Montoya (2016) also supported the research process perspective and further attested that a pilot study explores poorly covered theoretical domain to refine interview questions. Williams-McBean (2019) thus said that pilot studies work as tools to help researchers to either narrow down or broaden the scope of research questions in the early stages of scientific enquiries. Clearly, the focus by Williams-McBean (2019) is on research instruments. It should be from this perspective that Jane (2014) asked the question on whether a pilot study is necessary if the questionnaire had been validated by an expert researcher in the field.

From the viewpoint of researcher benefits, Doody and Doody (2015) posited that pilot-studying helps researchers to analyse preliminarily collected data, which in turn guides them in estimating the financial, time, personal and material resources needed to optimally carry out the broader version of the study. This position suggests that pilot studies guide researchers to affirm, sharpen or revise onto-epistemological assumptions (Bansal et al., 2018; Conn et al., 2010) upon which a study is built.

Janghorban et al. (2014) thus said that after pilot-studying, researchers may modify research instruments to ensure that questions that sound ambiguous and unclear to research participants are rephrased, replaced or left out. Simultaneously, research procedures that in the viewpoint of the researcher prove to be untenable may completely be avoided in the main study (Conn et al., 2010). Janghorban et al. (2014) further affirmed that where novice researchers are involved, pilot-studying helps to reduce the risk of problems that may arise in the main study during the processes of data collection, analysis and interpretation. This means that pilot-studying helps such researchers to anticipate problems that may arise in the main research and to decide on appropriate methods to mitigate or eliminate them beforehand. Fraser et al. (2018), citing earlier work by Prescott and Soeken (1989), thus said, "... not only can pilots help answer methodological questions that could guide the researcher toward empirically determined non-arbitrary answers to design issues that need to be addressed, pilot studies can serve other important purposes" (p. 263). Benefits of pilot studies as discussed in this section seem to justify De Vaus' (2013) caution: "Do not take the risk, pilot test first" (p. 54). According to Aziz and Khan (2020), talking specifically about qualitative research, pilot studies may also help beginner researchers to assess and reaffirm their enthusiasm and skills.

Literature as reviewed in this section has shown that many writers view pilot studies from a dichotomous perspective. The most outstanding classification appears to be the instrument testing-feasibility study dichotomy (Eldridge et al., 2016; Polit et al., 2001; Vogel & Draper-Rodi, 2017). The second classification comprises the research process-researcher benefits dichotomy (Janghorban et al., 2014). As literature has shown, an inclination to any one of these perspectives, or the other, seems to reflect on research practices finally adopted and the benefits accrued. An adoption of the narrow view of pilot-studying as merely pre-testing research instruments, for example, culminates into narrowed utilisation of the findings of pilot studies in shaping and enabling the main study to which the pilot study relates. In the same vein, a focus on the broad view of pilot studies provides "researchers with advance warning about where the main research project could fail, where research protocols may not be followed, or where proposed methods or instruments may be inappropriate or too complicated" for the work at hand (Van Teijlingen & Hundley, 2002, p. 35). In this article, we adopted a blend of the feasibility study and pilot-testing concepts. This hybrid perspective views pilot-studying as a combination of instrument testing and feasibility study from the perspective of both the research process and researcher benefits, including the supervisor as a key player in educational research processes. In line with this broad view, our study also brings the student researcher and the research supervisor to the fore. These are key players in educational research learning activities.

This article is a product of our desire as members of the academic community to fulfill the ethical and scientific obligations of researchers to share information and help other researchers to make the most of our resources. In doing so, we aim to contribute to the body of knowledge on meta-research (Peterson & Panofsky, 2020), that is research on research (Odigwe et al., 2020). Specifically, this article reflects on lessons learnt and improvements made to the research process, including research instruments and methodological issues as a result of lived experiences from pilot-studying for a PhD research study. This article is in line with Fraser et al. (2018) and Van Teijlingen and Hundley (2002), who proposed that researchers should be encouraged to not only report on how they carried out pilot studies for their studies, but also on the improvements made to the research design and the research process as a result of the pilot study. A unique feature of the current study is that pilot-studying as reported in this article is approached from the perspective of research processes and student researcher benefits, on the one hand, and from the perspective of the research supervisor as a key player in educational research, on the other hand. In this way, our article contributes to scholarship by elaborating and in many instances bringing new insights into the work of earlier writers on this important but under-reported, under-utilised and under-discussed element of the research process (Malmqvist et al., 2019; Schachtebeck et al., 2017). To the best of our knowledge, pilot-studying that focuses on educational research learning is an area that has not been fully explored.

4. Adjustments Made to the Main Study Following the Pilot Study

The pilot study reported in this article was carried out in a district other than the one which participated in the main study. The participants comprised the district schools inspector (DSI), the district resources teacher (DRT) responsible for special needs education (SNE), one school head and ten classroom teachers. The aim of the pilot study from the perspective of the student researcher (first author) was to test research instruments and research procedures in order to establish their goodness of fit for the task at hand. From the viewpoint of the research supervisor (second author), this was a teaching tool designed to guide the student researcher to refine the planned study with regards to issues of feasibility and the goodness of fit of the research methodology and research instruments for the task at hand. The pilot study was carried out after ethical clearance had been given by the University of the Free State. The ethical clearance number for the study is UFS-HSD2017/0531. Authority to carry out the research had also been granted by the Ministry of Primary and Secondary Education (MoPSE) in Zimbabwe. In addition, drafts of research instruments had also been reviewed and approved for pilot-testing by the research supervisor, and informed consent had also been obtained from research participants. Table 1 presents the original research instruments and the aspects of the research problem they were meant to address in the main study.

Table 1: Proposed research instruments for the main study

Description of research instrument	Purpose of research instrument
Interview guide for use with school heads	To collect qualitative data on school heads' construction and understanding of instructional leadership for inclusive secondary schools, challenges experienced, and on what they feel may need to be done to make inclusive schools more responsive to the needs of all learners.
Interview guide for use with the DSI and DRT	To collect qualitative data on how these key stakeholders' (i.e., DSI & DRT) understanding and practices of instructional leadership for inclusive secondary schools impact on school heads' construction and practices of instructional leadership in inclusive secondary schools.
Questionnaire for use with teachers	To collect quantitative data from teachers in order to validate findings from interviews with school heads concerning their (school heads') understanding and practices of instructional leadership for inclusive secondary schools.
Checklist for observational studies	To collect qualitative data on instructional leadership practices by school heads in the inclusive secondary schools studied.
Checklist for document analysis	To collect data on artefacts and other school leadership documents that shape instructional leadership practices by school heads in inclusive secondary schools.

As shown in Table 1, the original plan in the main study was to adopt an embedded mixed methods research approach (Yu & Khazanchi, 2017). The research was designed to embrace three categories of research instruments, namely questionnaires, interview protocols and checklists. The data collection procedure involved the student researcher, after agreeing on the research approach with the supervisor, visiting research sites to collect data in person. The research sites comprised a school and district offices in a district that was not scheduled to participate in the larger study. The research approach, research design and research instruments as originally planned were all put to test in the pilot study. Informed by the pilot study, adjustments to the original research plan were made, as further discussed below, beginning with adjustments on the target population.

4.1   Adjustments Made to the Target Population

The originally planned target population for the main study to which this article refers comprised school heads, classroom teachers, district education officers and DRTs for SNE. The key assumption in this respect was that education officials, school heads and classroom teachers could all provide information that talk to the challenges and opportunities for instructional leadership in inclusive secondary schools as experienced by school heads in inclusive secondary schools. Specifically, it was felt that interviews with school heads could provide insights into how they make sense of what instructional leadership for inclusive secondary schools means to them and how this sense-making shapes instructional leadership practices in this school setting. In addition, it was also felt that interviewing the DSI and the DRT would shed light on the challenges of instructional leadership as experienced by school heads. Data from questionnaires with teachers were meant to assist in validating the findings from interviews with school heads, especially on issues to do with instructional leadership practices in the schools studied.

Following a review and discussion of the student researcher's write-up that was made after the pilot study and his assessment of how the data were failing to neatly tie up as a coherent piece of art, the research supervisor made the following ground-breaking, game-changing and pace setting contribution (personal communication, 2017):

> *True, data collected from interviews with the District schools inspector and District resources teachers and that collected from classroom teachers may help to validate the findings of the study, especially on school heads' experiences of instructional leadership in inclusive schools. However, I suggest this validation may constitute the subject of a good study for another day and not the one we are involved in today. For now, let's focus on school heads and we leave the rest for a good study for another day.*

The verbatim excerpt above appeared as a silver bullet that helped the student researcher to redefine the target population, the methodology and onto-epistemological assumptions upon which the study is anchored. The excerpt above shows that the supervisor shared the view that data from classroom teachers, the DSI and the DRT could validate research findings in a study that sought to explore the challenges and opportunities for instructional leadership in inclusive secondary schools as perceived and experienced by school heads. However, after a review of pilot data, the supervisor was convinced the data could not be neatly tied together to produce a coherent thesis. Armed with this knowledge, the research supervisor then used evidence-based interventions to guide the student researcher and advised him to spare the study of classroom teachers, the DSI and the DRT for another day. On his part, the student researcher had also felt first-hand that it would have been extremely difficult to reconcile data from school teachers, the DSI and the DRT in a single study which sought to explore the challenges and opportunities for instructional leadership in inclusive secondary schools as perceived and experienced by school heads. In the backdrop of guidance by the research supervisor, as discussed above, district officials and classroom teachers were dropped from the target population for the PhD study to which the current study refers. School heads were thus the only constituent of the final target population for the main study. From the perspective of the student researcher, this adjustment made the study easily manageable and feasible, without deviating from the original purpose. Studies involving teachers, the DSI and the DRT were therefore spared for another day, given their value, as also discussed above, and the fact that all ethical issues had already been cleared and authority to research granted.

4.2   Adjustments Made to the Research Approach

The main study to which this article refers was originally planned to follow a mixed methods research approach. Following the pilot study and the subsequent adjustment to the target population by dropping classroom teachers, the DSI and the DRT from the main study population, the research

design was also adjusted to adopt a qualitative approach. The quantitative phase of the study, as originally planned, was dropped. This adjustment was made because an analysis of data from the pilot study convinced the research supervisor that the central research question: What are the challenges and opportunities for instructional leadership in inclusive secondary schools and how does sense-making by school heads explain their construction and practice of instructional leadership in inclusive secondary schools?, could best be answered by qualitative data. This means that by piloting the main study, the research supervisor was able to use evidence-based interventions to guide the student researcher that the study, which used an interpretivist epistemology and sense-making lens, was inherently qualitative and needed to be handled as such. This advice is in line with Creswell and Creswell (2017), who defined interpretivism as the philosophical partner for qualitative research.

Clearly, the insight gained from the pilot study, as reported in this article, provided the silver bullet that cleared the way and set the pace for the student researcher to easily navigate the long, bumpy, winding and sometimes swampy road towards completing a PhD degree programme that touched on issues to do with making sense of how school heads make sense of instructional leadership for inclusive secondary schools. This insight helped the student researcher to carry out the planned research and successfully complete the degree programme within the expected time, without the frustration of being stuck with his study for years with no clear end in sight. Undoubtedly, a PhD degree programme is a journey that many have embarked on but could not complete when they became entangled along the way for failure to adequately prepare by way of pilot-studying, for example.

4.3 Adjustments Made to Research Instruments

As shown in Table 1, the main study to which this article refers was originally planned to employ five sets of research instruments. These include: (a) an interview guide for collecting interview data from school heads, (b) an interview guide for collecting interview data from district officials (DSI & DRT), (c) a questionnaire for collecting data from classroom teachers, and (d and e) two checklists. The first checklist was planned for use during the document analysis phase of the study and the second was meant to guide the observation phase. After data collection for the pilot study, an exit interview was conducted with the research participants. This was done to thank participants for the role they played in the pilot study and to elicit their views arising from their participation in the pilot study. In the main, the participants opined that the questions asked them were clear and easy to understand. However, the school head, after a feel of the planned research process following his participation in the pilot study, asked the following question: *"You mean you are going to collect all the required data from three schools and analyse them all by yourself?"* The student researcher wanted to know why the head asked this question, to which he explained as follows: *"I am looking at the time you spent in this school and the amount of data you collected, and am saying to myself, 'If you are so detailed in a pilot study, what will be of the actual study?' Surely, a PhD is not a stroll in the park."*

From the perspective of pilot-studying, the verbatim excerpt above points to two important conclusions. The first conclusion is that research participants approved the internal validity of the instruments and the rigorous nature of the planned study. The second conclusion is that the excerpt points to possible challenges of the researcher handling too much data, which may be difficult to merge and create a coherent picture of the reality that the larger study sought to establish. During the interviewing process, the student researcher also felt that in some cases, the interview protocol was not probing enough. Following the pilot study, as discussed above, a number of adjustments were therefore made to the research instruments that were originally planned for adoption. The first major adjustment was that since the target population had been adjusted after dropping district officials and classroom teachers, research instruments were also streamlined accordingly. This external adjustment to research instruments was achieved by dropping the questionnaires for teachers and the interview protocols for education officials from the main study. The final list of research instruments after this external adjustment comprised the interview guide for use with

school heads, and two checklists. One checklist was meant for use during the observation phase of the study. The second checklist was meant for use during the document analysis phase. Following this external adjustment to the research instruments, internal adjustments were also made on two of the three instruments that passed the pilot test. The following section presents the instruments that were finally employed in the study and the internal adjustments effected after agreement between the student researcher and the supervisor. We begin this presentation by focusing on the interview guide used for collecting interview data from school heads (Table 2).

Table 2: Original interview protocol for school heads and internal adjustments made

Part A: Bio-data: Questions to be asked on the following: (i) Age, (ii) gender, (iii) highest qualifications, (iv) length of experience as a school head (a) in the current school and (b) elsewhere. **Part B**: School heads' construction and understanding of instructional leadership. 1) What do you consider to be your most important responsibilities (expectations) as a school head in this school? [Probe: Why do you consider them as your most important responsibilities?] **Change: Q1**: Moved to Q2, as Q3 was moved to Q1. 2) What do you consider to be your most important objective as an instructional leader in this school? [Probe: (i) Why do you say so? (ii) What more can you say?] **Change: Q2**: Moved to Q3 as Q3 was moved to Q1. The probe question was adjusted by adding the questions: (i) Why do you consider them to be your most important responsibilities? (ii) What more can you say? 3) School heads are often faced with dual responsibilities of school management and providing leadership in the teaching/learning programmes. What do you consider to be your most important responsibility between the two? [Probe: (i) May you briefly explain your response. (ii) What do you see as the major activities involved in providing effective leadership for successful teaching and learning programmes in this school?] **Change: Q3**: Moved to Q1. Probe question (ii) was adjusted by inserting 'instructional leadership' in between 'learning' and 'programme'. 4) In your opinion, do you feel that leadership of learning in inclusive secondary schools is similar to leadership of learning in selective schools? [Probe: (i) Why do you say so? (ii) May you shed more light on this.] 5) In your opinion, do you consider it important for your school to define a clear vision and mission statement? [Probe: Why do you say so?] **Change: Q5**: Reworded and expanded to make it more elaborate and exhaustive. (See details below.) **New Q5**: Whose responsibility do you feel it is to (i) define and (ii) communicate the school vision to stakeholders? [Probe: (a) May you please comment on the role of (i) the MoPSE, (ii) the RA, (iii) parents, and (iv) the community served by the school on defining the inclusive vision for this school.] 6) Do you feel that defining a school vision and mission is entirely your sole responsibility as a school head in this school? [Probe: Why do you say so?] 7) Do you consider it important that school authorities develop a shared inclusive school vision with each of the following stakeholders: (i) parents of children without special needs, (ii) parents of children with special needs, (iii) the surrounding community, (iv) the responsible authority, (v) teachers and (vi) the ministry? [Probe: May you justify your response.] **Change: Q7**: Moved to Q6 to improve coherence in the way questions were asked. 8) Whose responsibility do you feel it is to (i) define and (ii) communicate the school vision and mission to educational stakeholders? [Probe: (i) Briefly explain your response. (ii) What do you see as (a) the role of teachers and (b) the role of parents in this respect?] 9) In your opinion, do you feel it is entirely your individual responsibility as an officially designated instructional leader to make this school conducive for effective teaching and learning? [Probe: (i) Why do you say so? (ii) May you say a bit more. (iii) What would you consider as hallmarks of effective teaching and learning?] 10) Do you feel it important that teachers in inclusive secondary schools are rewarded for working with learners with exceptionalities? 11) Do you consider yourself adequately empowered to recognise and reward teachers for their participation in teaching learners with special needs? [Probe: May you briefly explain your response.] **Change: Q11**: Adjusted by adding two more probe questions: (ii) What do you do to motivate teachers? (iii) What more do you do? 12) In your opinion, do you feel you are getting the support that you deserve from each of the following stakeholders as you carry out your duties on leading learning in this school? (i) Parents of children without special needs, (ii) parents of children with special needs, (iii) the surrounding community, (iv) the responsible authority, (v) your own teachers and (vi) the ministry? [Probe: (i) Why do you say so? (ii) What more do you feel may still need to be done?] **Change: Q12**: Adjusted by adding a third probe question: (iii) What is the nature of the support you are getting? 13) In your opinion, are you convinced the ministry is doing enough to recognise and reward teachers for their participation in inclusive education? [Probe: (i) Why do you say so?] **Change: Q13**: Merged with Q15 and moved to Q14 as a new Q13 was introduced. (See details below.)

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New Q13: In your opinion, to what extent does the MoPSE's support of your inclusive approach to education impact on the effectiveness of your leadership of learning in this school? [Probe: (i) May you say a bit more. (ii) Do you consider such support adequate?]

14) In your opinion, do you feel that rewarding teachers for embracing educational inclusion of learners with special needs is an indicator for the ministry's commitment to inclusive education?

15) Do you consider rewarding such teachers important? [Probe: May you shed more light on this.]

16) Do you consider that teachers in this school have been adequately trained to handle children with special needs? [Probe: Do you consider such training important?]

17) Do you consider that training of secondary school teachers to handle inclusive classes is an indicator of the government's commitment to educational inclusion? [Probe: Why do you say so?]

18) In your opinion, do you feel the community being served by your school views your school in a positive limelight for embracing the inclusive framework? [Probe: Why do you say so? (ii) What more do you feel may still need to be done?]

19) In your opinion, are you convinced that the ministry shares the inclusive vision as embraced in this school? [Probe: Why do you say so?]

20) In your own assessment, are you convinced the inclusive philosophy which has been adopted in this school helped to improve the image of their schools in the eyes of (i) the ministry and (ii) the community around the school?

21) What benefits do you feel accrue to you for embracing educational inclusion in this school? [Probe: May you say a bit more.]

22) To what extent do you feel that the benefits that accrue to you for embracing inclusion motivates you to maintain the inclusive philosophy in this country? [Probe: May you briefly explain your response.]

23) (i) How do you rate ZIMSEC examinations in terms of their suitability in addressing the needs of learners with learning difficulties? (ii) What do you feel still needs to be done to make the examinations system more suited to the special needs of learners with exceptionalities? [Probe: May you say a bit more on this.]

24) To what extent do you subscribe to the assumption that every school child is capable of passing at least five O-levels, including English language and mathematics? [Probe: Briefly explain your response.]

25) To what extent do you feel that educational inclusion of learners with exceptionalities improves the image of your school in the community that is served by this school? [Probe: May you shed more light on this.]

26) In your own assessment, are you convinced that learners with learning difficulties and those with physical disabilities are effectively benefitting from the inclusive framework as adopted in this school? [Probe: (i) Why do you say so? (ii) What do you feel may still need to be done to make such learners benefit more?]

Change: Q26: Reworded to make it clearer and easier to understand. (See details below the table.)

New Q26: To what extent do you subscribe to the thinking that every child is capable of passing at least five O-levels, including English language and mathematics? [Probe: May you briefly explain your response.]

27) In the light of how (i) effective performance of teachers, (ii) effective performance of schools and (iii) effective learning are assessed and rewarded, are you convinced that the ministry genuinely expects schools to embrace full inclusion of learners with exceptionalities? [Probe: May you briefly explain your response.]

28) In your own assessment, to what extent do you feel that measuring (i) effective learner learning and (ii) effective performance of schools only in terms of how learners perform in public examinations effectively motivates you to embrace inclusion of children with special needs in the mainstream education system?

29) When teachers are involved in professional development programmes, there is obviously loss of teaching time. Do you continue to encourage your teachers to further their education through in-service programmes under these conditions? [Probe: Justify action in this case.]

30) Do you consider it important that teachers are involved in assisting others in handling learners with exceptionalities? [Probe: Why do you say so?]

31) The inclusive philosophy seems to be based on the principle that school programmes should be modified to meet the special needs of learners and not vice versa. Do you still impress upon each one of your learners to pass five O-levels as a standard measure for success? [Probe: May you please justify your position.]

32) In your opinion, how does the ministry's support of your inclusive approach to education impact on your leadership of learning in this school? [Probe: May you say a bit more on this.]

Change: Q32: Dropped and three more questions added. These were adopted from the questionnaire and interview guides for the district officials and teachers (See details below.)

New Q32: Whose responsibility do you feel it is to supervise teaching/learning activities in this school? [Probe: (a) What role is played by each of these stakeholders in supervising teaching/learning activities: (i) deputy head, (ii) senior teacher or (iii) HODs? (b) Who else is involved in supervising teaching/learning activities in this school? (c) (i) Do you see it important that you should share instructional leadership roles with other stakeholders in this school? (ii) May you briefly explain your response.]

Added Q33: Inclusive education is based on the principle that school programmes should be modified to meet the special needs of learners and not vice versa. Do you impress upon every one of your learners to pass five O-levels as a standard of success? [Probe: (i) May you please justify your position. (ii) How else do you measure student learning in this school?]

Added Q34: To what extent do you see the following artefacts used in Masvingo district as supportive of inclusive practices such as adopted in this school: (i) The legal framework? (ii) Supervision instruments? (iii) Policy circulars? [Probe: (i) Is there any other artefact that you see important? (ii) What more can you say? (iii) Briefly explain your response.]

Added Q35: What prospects do you see for the future of inclusive education in this district? [Probe: (i) May you briefly explain your response. (ii) Is there anything that you see as an impediment to inclusive education in this district? (iii) What do you see as promoting inclusive education in this district?]

Table 2 shows the changes that were made to the final interview guide that was used to collect interview data from the school heads. The table shows that only a few changes were made to the interview guide. The reason why only a few elements of the instrument appeared to need adjustment is that the instrument had gone through the mill. However, the few adjustments made were important for the success of the research approach finally adopted in the study. As shown in Table 2, the changes involved rewording, reordering or expanding existing questions, merging of questions, and in a few cases, addition of new questions. These changes came about following the reality as experienced through the pilot process that the existing order of the interview questions could not yield a smooth flow of the interview discussion. Internal adjustments of the research instruments as introduced in this section are further discussed after the section on adjustments made to the checklists, the second set of research instruments that had survived the pilot test phase of the study. Table 3 presents the changes that were made to the document analysis checklist.

Table 3: Checklist for collecting data during the document analysis phase of the study

The following documents will be analysed:
1. Minutes of staff meetings:
a. To establish the extent to which meetings talk to issues of educating every child in inclusive settings.
b. To get a feel of leadership distribution in the schools under study.
c. To get an appreciation of the problems and benefits which accrue to school heads for their leadership of learning in inclusive settings
d. To get a feel of the instructional leadership activities employed by school heads in inclusive settings.
2. Samples of exercise books: Emphasis will be on the quality of marking, the comments given by teachers and how school heads assist teachers to help children with special needs in inclusive classes.
3. Report books and mark schedules: Attention will be focused on the quality of marks, the comments given by teachers, and whether teachers are encouraged and assisted to follow up on poor performance by children with learning difficulties.
4. Supervision reports: These are analysed to establish (i) the extent of distribution of instructional leadership, (ii) the type of assistance that teachers are given to help learners with exceptionalities and (iii) the extent to which instructional leaders emphasise the need to educate every child.
5. Vision and mission statements: These are analysed to establish if they talk to issues of inclusion and quality of education in inclusive settings.
Changes: Added item No. 6: Any other instructional leadership artefact, for example job description (i.e., of deputy heads, HODs, senior teachers, class teachers etc.), which may have implications on instructional leadership practices by school heads?

Table 3 above shows that after the pilot study, one major adjustment was made to the checklist for document analysis. This adjustment involved the addition of a sixth item to the instrument. Experience from the pilot study had revealed that there may be a large number of instructional leadership artefacts in inclusive secondary schools. These artefacts were assumed to have implications on sense-making and instructional leadership practices by school heads and hence needed to be analysed as part of the larger study to which this article refers. However, the original checklist for document analysis that was designed for pilot-testing did not provide for checking on the existence and content of such artefacts in the target research sites. The adjustment made to the checklist by adding item six (see Table 3) was meant to address this shortcoming. The objective was to make sure that this research instrument becomes more exhaustive and inclusive of all important elements to be studied. Outside the sixth item added, no other change was made to the checklists used in the larger study. Specifically, no changes were made on the checklist used to collect data for the observation phase of the study. This explains why there is no table in this section showing internal adjustments made to this checklist, even as this instrument also survived the pilot test.

5. Discussion of Adjustments Made to the Main Study

In this section, we discuss the adjustment made to the main study, following the pilot study referred to in the present article. We begin the discussion by presenting a summary of the major categories of elements of the original research plan that were adjusted as a result of the pilot study (Table 4).

Table 4: Main elements of the original research plan adjusted following pilot-studying

1. The target population
2. The research instruments
3. The research approach
4. The research design

Table 4 shows four major categories of the changes that were made to the research plan originally planned for adoption in the main study to which the current article refers. It will be recalled that, initially, the study was planned to adopt a mixed methods research approach. It will further be recalled that, originally, it was thought the data collected from the DSI, DRT and classroom teachers would help to validate data collected from school heads concerning the challenges and opportunities for instructional leadership as perceived and experienced by school heads in inclusive secondary school settings. Data as presented in this article show that the pilot study provided the research supervisor with the silver bullet that helped the student researcher to redefine the methodology, the target population and the onto-epistemological assumptions upon which the study is anchored. Following his review of pilot data presented by the student researcher, the research supervisor was equipped with information to help him guide and show the student researcher that data in the main study will not tie together easily to produce a coherent whole unless major adjustments were made. In line with this thinking, the research supervisor made a ground-breaking and pace setting contribution to the main study as originally envisaged. He said: "True, data collected from interviews with the District schools inspector and District resources teachers and that collected from classroom teachers may help to validate the findings of the study, especially on school heads' experiences of instructional leadership in inclusive schools" (personal communication, 2017). Undoubtedly this remark shows that these data were important. However, the research supervisor further observed: "... this validation may constitute the subject of a good study for another day and not the one we are involved in today. For now, let's focus on school heads and we leave the rest for another day" (personal communication, 2017). Clearly, the observation and suggestion as given above had implications on concept mapping (Hay et al., 2008), problem refinement (Watson & English, 2017) and refocusing the study to the main issues involved in the central research question.

When the supervisor's recommendation as tendered above was factored into the study, the original research approach, the research design and the research instruments as initially planned for use in the main study were adjusted accordingly. Carroll et al. (2013) and Yin (2016) described this type of adjustments as refining the research methodology. It can therefore be said here that the pilot study enabled the supervisor to use evidence-based interventions to guide his student to refine the research methodology for the main study. This also helped the student researcher to establish a good theory-method fit (Gehman et al., 2018) for the main study. For example, when the target population and hence research participants were redefined, the study shifted from a mixed methods study to a qualitative study. As a result of the supervisor's recommendations, some research instruments that were planned for use were also dropped from the study. The shift from a mixed methods study to a qualitative study also aligned the main study more strongly to the interpretivist epistemology (Chipindi et al., 2020) and sense-making theory that were adopted. This alignment is in line with Creswell and Creswell's (2017) proposition that interpretivism is the philosophical partner of qualitative research. In addition to focusing the study away from a mixed methods research approach to a qualitative approach, the research instruments that passed the pilot test were internally adjusted

or refined, as shown by the data presented in this study (Carroll et al., 2013). Table 5 below presents a synopsis of the internal adjustments made to the research instruments that survived the pilot test.

Table 5: Summary of internal changes made on research instruments

Changes made to the interview guide for use with school heads	
Question Number	**Changes Made**
Question 1	Reordered
Question 2	Reordered as two probe questions were added
Question 3	Reordered as one probe question was added
Question 5	Two additional probe questions were added
Question 7	Reordered
Question 11	Two additional probe questions were added
Question 12	One additional probe question was added
Questions 13 & 14	Merged and reordered
Question 26	Reworded and reordered
Question 32	Replaced as three new questions were added
Changes made to the checklist for use in the document analysis phase of the study	
Item number	**Changes made**
Item 6	An open-ended question was added

Table 5 shows four categories of internal adjustments that were made to the research instruments following the pilot test. These changes involved reordering, rewording, merging and in some cases expanding research items on research instruments by adding more probing questions. These are the types of adjustments that Carroll et al. (2013) defined as refining research instruments. Such adjustments helped to improve the flow of interview discussions and to avoid bored interviewees by conducting interview discussions that appeared poorly organised. In addition, they helped to make the instruments more exhaustive. All the adjustments as discussed in this section were motivated by experiences gained from the pilot study. Specifically, it was discerned during data collection for the pilot study that six questions on the interview guide, that is questions 1, 2, 3, 7, 13 and 26 (see Table 5), needed to be reordered to allow a smooth flow of the interview discussion. It was also observed during the data collection process that five questions on the interview guide, that is questions 2,3, 5, 11 and 12 (see Table 5), needed additional probing questions in order to make the data collection process more exhaustive and to easily move the research process towards data saturation. Experiences from analysing the pilot data also revealed that questions 13 and 14 on the interview guide asked for similar types of information. To allow a smooth flow of the interview process, these questions needed to be merged (see Table 5). Merging these questions was designed to improve the flow of the interview discussions by avoiding overlapping questions. Clearly, internal adjustments to research instruments, comprising reordering, rewording and merging of items and the addition of probing questions as discussed in this section could not be possible without the pilot study and at the end of the day made the large PhD study possible. Pleasants and Olson (2019) defined these types of adjustments as refining research instruments. The aim here is to improve the probability of success for the main study for which the pilot study is carried out.

Table 5 shows two more changes that were made to the interview guide and the checklist that was used for the document analysis phase of the study. Following the pilot study and subsequent changes to some aspects of the study, item 32 on the interview guide for school heads was deemed redundant. As a result, this item was dropped from the interview guide and in its place three new questions were added. The added questions were derived from the interview guide for district education officials. This interview guide for district officials did not survive the pilot test since the district officials, that is, the DSI and the DRT (SNE) were dropped from the population of the main study. As shown in Table 3, the last major internal adjustment made to the research instruments involved the addition of one extra item onto the checklist for use in the document analysis phase of

the larger study referred to in this article. The new item was meant to collect data on instructional leadership artefacts (Table 3). This addition was made after experiences with the pilot study had shown that a number of artefacts with ramifications on instructional leadership practices could be overlooked unless a conscious effort was made to ensure that the research instruments were capable of collecting data concerning such artefacts.

Data as presented above support assertions by many writers that pilot-studying in social science research, including in education research, is important in many ways (Aziz & Khan, 2020; Crossman, 2019; Ismail et al., 2018; Schachtebeck et al., 2017). A review of literature has shown that in addition to instrument refinement (Pleasants & Olson, 2019), pilot-studying also has implications on the research process and researcher benefits. The current study has also shown that in addition to being important from the perspectives of instrument refinement, research process and researcher benefits, pilot-studying in educational research learning is also important from the perspective of the research supervisor, a key player in education research involving student researchers. In the pilot study reported in the current article, for example, the research supervisor was able to use data-driven decision-making to guide the student researcher to refocus the study. Using evidence from the pilot study and how the student researcher could end up with challenges in harmonising varying data from his multiple sources, the research supervisor was able to guide the student researcher to avoid such challenges. The research supervisor observed that although data collected from interviews with district officials and classroom teachers may help to validate the findings of the study, such validation could constitute the subject of "a good study for another day". This observation, which was guided by evidence from the pilot study, made the research supervisor to recommend that the planned study focus on school heads only and to exclude the teachers and education officials for a separate study. These recommendations had implications on concept mapping (Hay et al., 2008), problem refinement (Watson & English, 2017) and refocusing the study.

Clearly, experiences and reflections as shared in the current article show that in addition to being important from the perspectives of instrument refinement, research process and researcher benefits, pilot-studying in educational research may also be important from the perspective of the research supervisor. For example, it can make research supervisors better placed to guide student researchers to navigate the long, bumpy, winding and sometimes swampy road to completing an educational research study, such as expected in a PhD degree programme. From the perspective of researcher benefits, pilot studies as discussed in the current study focus on student researchers. It has been observed, for example, that in addition to meeting the narrow but still important objectives of refining research instruments, pilot studies also help student researchers to find a good theory-method fit (Gehman et al., 2018) in the early stages of scientific enquiries. When this happens, it thus enables student researchers to avoid the risks and frustration of being stuck with their studies with no clear end in sight. In this sense, pilot-studying can thus prevent the risks involved when a student researcher may be forced by circumstances to abandon a particular research approach after having gone too deep into a study. Alternatively, the student researcher may be forced to change some major components of the research process, such as the research approach, research design or data collection techniques after having gone too deep into a study. In both cases, these risks have ramifications on successful completion of educational research programmes, such as the PhD degree programme by the student researcher involved, something that wastes both time and resources. Given these risks, De Vaus (2013) thus warned: "Do not take the risks, pilot test first" (p. 54).

6. Final Thoughts

This article contributes to scholarship by elaborating and in many instances adding new insights on the work of earlier writers on the youthful but important discourse on meta-research with particular reference to pilot studies in educational research. The central argument in this article is that pilot-studying in educational research learning is important from the perspective of the research process and researcher benefits. In addition, pilot-studying may also be important from the perspective of

research supervisors in their capacity as promoters of academic research. To the supervisor, for example, a pilot study may form the basis for evidence-based supervision and guidance for student researchers. Following a pilot study, it may be easy for the research supervisor to use evidence-based interventions to guide student researchers in concept mapping, issue refinement and in finding a good theory-method fit. In the main study that informs the current article, it was established after the pilot study, for example, that the target population as originally envisioned was rather too broad, and that some of the research instruments were not necessary for the research problem at hand. Originally, there were questionnaires for teachers and interview protocols for school heads and district officials. Following the pilot study, it was realised that the involvement of teachers and district officials in the main study served little purpose, given the nature of the research problem at hand. Specifically, it was concluded that a study on the district officials and classroom teachers, though important, could rather be spared for another day. The pilot study as reported in this article therefore caused the research approach, the research design and the research instruments that were finally embraced in the main study to be refined. Experiences gained through pilot-studying for the main study to which this article refers support De Vaus' (2013) warning: "Do not take the risks, pilot test first" (p. 54). Key contributions of this study to scholarship include that pilot-studying also helps student researchers to find a good theory-method fit (Gehman et al., 2018), improves the quality of research projects and enables student researchers to complete their studies in time. In addition, pilot studies may also assist research supervisors to develop evidence-based insights that make them better placed to guide student researchers through the rigours of a potentially long, winding, bumpy and sometimes swampy road towards completing learning programme such as a PhD degree programme. Cope (2015) thus asserted that whereas a pilot study could be seen as "a burden or an added step in conducting a large-scale study", researchers can realise benefits from these investigations in ways that "outweigh the added effort and increase the likelihood of success" (p. 196). Given the benefits that accrue from sharing information obtained through these studies, it is recommended that researchers should publish results of pilot studies for the benefit of others. It is in line with this type of thinking that Odigwe et al. (2020) encouraged researchers to publish articles on research on research. In fact, since research is a community project, researchers need to observe their ethical and scientific obligations to share information generously and thus help other researchers to make the most of their resources. This type of thinking made the current study in which we share our lived experiences and insights with other members of the academic community worthwhile.

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