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Understanding and Developing a Problem Statement: A Guideline for Novice Researchers

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Abstract

A problem statement is one of the most crucial and least understood research components for young scholars or early-career researchers. These novice researchers, mostly undertaking tertiary education with the requirements of dissertation and thesis writing or attempting to draft their first journal manuscript(s), often encounter this common dilemma. Thus, the process of reflecting, defining, and formulating a sound research proposal is perhaps one of their most confusing, traumatic, and dreaded nightmares. Often confused by many as synonymous with a statement of purpose and research questions, a problem statement is quite different and unique, as outlined in this article. Accordingly, this paper systematically unpacks the basic constituents of a problem statement, provides a step-by-step procedure for its formulation, and provides a vivid illustration. Overall, this paper lays out a basic framework that can be used in any social science and humanities research endeavor but cautions the need for modification to suit specific fields.

Keywords: Dissertation; Thesis; Research Process; Problem Statement; Research Question; Guidelines

Introduction

A problem statement is the cornerstone of any research and is the hub that holds the entire research design (Leedy & Ormrod, 2005) [1-5]. However, and in general, understanding and writing a problem statement seems to be one of the most challenging tasks for novice researchers who are either young scholars or early-stage scholars, whether it is for a dissertation, thesis, or journal article. Specifically, for most students undertaking tertiary studies, they do not really know where to start [6], often they spend hours cracking their heads trying to develop a jargon-loaded topic aimed at impressing their supervisors and research mentors that their topic is worth pursuing. As a result, a sophisticated topic is often formulated from one's own 'imagined research gap' or 'personal opinion' that is not necessarily supported by a thorough literature review. Clearly, such candidates are oblivious to the fact that any research endeavor, be it for a dissertation project or journal article, owes its genesis to a meaningful problem statement and nothing else. While the literature on a problem statement is vast [4,7-9], this paper aims to provide a nuanced understanding of a problem statement and operationalize it with a step-by-step procedure and illustrative example.

In this paper, we first define a problem statement and make attempts to highlight the significance of a problem statement in the research process. Second, we provide a step-by-step guide for its formulation inspired by Clarke [10]. Specifically, we explore some of the key words associated with a problem statement, its general structure, and the basic proponents behind its formulation, which include the principal, interactive, and speculative propositions. All this is then followed by a carefully formulated illustration of a problem statement based on the work of Machiridza [11], specializing in the field of historical archaeology. We conclude by reiterating that this is only a general guideline to be applied in any field of social sciences and humanities, but caution that modifications may be necessary to adapt it to specific disciplines of study.

What is a Problem Statement?

A problem statement or statement of the problem is often conflated with a statement of purpose and the overarching research question by some scholars [12,13]. These social facts, according to Searle's [14] social ontology approach, are different

from each other. In fact, a statement of purpose usually comes after the statement of the problem, and it simply indicates what the study hopes to achieve, while a research question comes after the statement of purpose [3,15]. The research question basically helps in the streamlining of ideas after the problem has already been identified and defined. While the other aspects are important, in this paper, our focus is on the problem statement or statement of the problem. We will first define a problem before we delve into understanding a problem statement. According to Clark et al. [10], "a problem is a situation resulting from the interaction of two or more factors (e.g., givens, constraints, assertions, beliefs, conditions), which reveals an anomaly or contradiction which, in turn, yields.

i. A perplexing or enigmatic state.

ii. An undesirable consequence.

iii. Ambiguous preferences or choices from among courses of action.

While the above refers to a problem as relating to something that is unsettled, vexing, perplexing, challenging, and conflicting, of major concern, controversial, an issue, a research problem, or what makes a problem research worthy, it specifically refers to a limitation or gap in knowledge supported by literature or lack thereof that deserves careful and serious scholarly attention [6,8,16]. Thus, the researcher feels that there is something that is lacking and is a problem that deserves attention in a theoretical or practical context [17]. This problem often becomes a cause for concern because it has or is causing adverse impacts in a field of study or community. In this respect, the problem should be of interest first to the researcher, other members of the academic community, and wider society [18-20]. Most importantly, the problem should create reader interest in addition to being significant and relevant to a specific field of study [10,21]. The identification of the research problem is one of the most difficult and important parts of the entire research process [10,22,23]. The identification of the research problem can consume a lot of time for the researcher because, usually, one does not have a clear idea of the problem at the beginning but may go forth and backward until a clear picture is obtained [22]. It is only after a full appreciation of the research problem that one may be able to systematically craft a clear, complete, and succinct problem statement or statement of the problem.

Overall, a statement of the problem then becomes a sentence(s) that precisely outline the research issue, its background, relevance for study and relevance to the community, academic, or general society, and the critical path that determines whether a study is worthy of pursuing or not [1,2,5]. We can bring back the social ontology approach by Searle [14] to conceptualize and describe a problem statement by first stating what the meaning of a 'thing' is, and then go on to describe how the 'thing' is constituted or the various parts that make its structure. First, a problem statement is best conceptualized as a statement(s) of a documented problem, verified and supported by the literature as needing scholarly attention or some kind of intervention to provide benefit or add value to a field of study or community [24]. Second, it may also be described as a set of declarative sentences that clarify what is to be investigated and why, stipulating the problem in greater detail and justifying the need to investigate it. These statements define the context of the study, which helps in the generation of questions that the research hopes to address. They identify and define the problem in a manner that highlights the kind of intervention needed to either alleviate or completely eradicate the problem, or the goal of the research. Thus, these statements together with the problem statement shape the research questions, which, in turn, shape the tone of the study objectives and, hence, the need for coherence and consistency between them [13].

Furthermore, in terms of structure, a problem statement comprises a 'general problem' that sets the broader context, significance of the problem, or key facts, and a 'specific problem' that is localized, limited in scope, and succinct [1]. Together, these parts take a funnel shaped approach from a broader context to a specific context. The general problem introduces the broader issues, supports or validates the problem with relevant and recent literature. Otherwise, in the absence of recent literature, the problem may have been addressed, and, thus, there is no research gap [25] and, therefore, no longer a research problem as it does not lead to any contribution to the body of knowledge. After introducing the general problem, one needs to narrow it down to the specifics by validating the existence of the same problem by citing several other appropriate sources [1,26]. This, in essence, is tantamount to delimiting the study area and identifying the audience (who is affected by the problem and who will benefit from the investigation).

Lastly, it is important to reiterate that a good problem statement comes from a rigorous literature review [3-6,8,16]. Equally, or even more importantly, it must enable the reader to easily understand the research problem. It is not based on opinion but must point out the deficiencies in the literature, clearly delimiting the research area. Always remember that a problem statement is the epicenter of the entire research design; if poorly done, it affects the entire research, and when properly done, it makes the journey enjoyable, meaningful, and impactful. Its development is never a once-off event; rather, it takes several adjustments and alterations before getting it right. Therefore, it follows that there is no quick solution or straitjacket approach when developing a problem statement. It is always important to keep in mind that good problem statements evolve through constant opinion shifts and time. Often, what emerges from a literature review contradicts our initial hazy assumptions about the existing problem, so one should always be prepared to shift opinions as and when necessary. The subsequent section provides a methodological formulation of a problem statement using a framework proposed by Clark et al. [10].

Generating a Problem Statement: A Methodological Approach

Several approaches could exist on how to generate a problem statement. However, we find the approach by Clark et al. [10] to be a simple and valuable tool to build an understanding from some first principles. The approach has been acknowledged and employed in recent literature by Jacobs [8] and Schweinsberg et al. [4]. According to Clark et al. [10], after identifying and defining the problem from a literature review, the researcher should at least be able to generate a problem statement that comprises three propositions. Such propositions include a 'principal proposition', an 'interactive proposition', and a 'speculative proposition(s)'. Clark et al. [10] further note that the principal proposition is usually described in the form of a generalization or a generally accepted proposition. This is elucidated by Schweinsberg et al. [4] as an accurate description of a condition, a widely accepted theory, or ordinary knowledge about practice. Simply put, a principal proposition is based on pure or widely accepted facts. about the knowledge or understanding of phenomena or the reality out there [8].

On the other hand, Clark et al. [10] argue that an interactive proposition is stated in similar terms to the principal proposition; however, it contradicts, challenges, or casts doubt upon it. Simply put, it is a statement that creates intellectual tension using key words such as 'however', 'but', 'yet', 'although', 'lack of', 'limited', and 'difficulty', among others [8]. More importantly, it cannot just be a statement based on conjecture or opinion but must be backed by literature. While Jacobs [8] reiterates the original thinking by Clark et al. [10], he missed that it is the interaction between the principal and interactive propositions that creates a research problem, an anomaly, controversy, gap, or conflict that needs to be addressed. Taken together, the principal and interactive propositions typically help readers anticipate the goals of each study [7]. After this, one can then speculate about this problem or controversy, thus leading us to the third and last part of a problem statement, which is the 'speculative proposition'.

Lastly, Clarke et al. [10] suggest that the speculative proposition proffers certain ideas about the most likely causes of the problem, controversy, conflict, or contradiction, thereby setting the general tone for research inquiry. In the same vein, Jacobs [8] argues that "the speculative proposition juxtaposes the previous two sets of information, which are both offered as being true, and suggests why it might be important to resolve the contradiction that they seemingly have caused." Following Kapur [9], we can argue that a speculative proposition is a conjectural or human device for anticipating the events that are about to happen. In other words, it is the final assertion of what should be done, derived, or required from the study. It allows the researcher to use a bit of imagination based on certain insights derived from literature. Logically, the speculative proposition leads us to the statement of purpose and research question(s). The subsequent sub-section illustrates this methodological framework premised on these three propositions with the aid of a specific example.

Problem Statement: An Example

Building on the previous sections, we provide an illustration of how to operationalize or construct a problem statement drawing on one of the co-author's proposals for a PhD on the historical archaeology of the Rozvi in south-western Zimbabwe (Machiridza, unpublished PhD thesis). This example attempts to highlight how the three propositions (principal, interactive and speculative) can be integrated in the formulation of a complete problem statement. Those words and sentences that are either bolded or underlined illustrate the key components of the principal, interactive and speculative propositions respectively.

Principal proposition: Khami-phase sites are important elite settlements of the Zimbabwe Culture but their archaeological status in relation to the Torwa and Rozvi dynasties as well as the origins and development of complexity in south-western Zimbabwe remains poorly comprehended [27-31]. Here, the principal proposition as stated by Clarke et al. [10] gives a broader context of elite settlements in archaeology but also groups or situates the study within a broader geographic context. Thus, the researcher provides a backdrop or background of what is known about the phenomenon of interest, which generates further interest that leads to the next aspect, interactive proposition.

Interactive proposition: It, however, remains very difficult to ascertain whether the Khami tradition develops directly from Leopard's Kopje cultures, or it was a result of dynastic influences from Great Zimbabwe [32-35]. Other historical references seem to portray a picture that the founders of Khami-phase sites (the Torwa) were breakaway rebels from the Mutapa state [34,35]. Therefore, what this implies is that there are three models for the origins of Khami-phase sites in south-western Zimbabwe, but none of these assumptions has yet been systematically tested archaeologically for approval. Furthermore, it remains unclear what exactly happened to the archaeological record when the Rozvi later arrived in the south-west around the 1690s until they were disposed by the Ndebele in the 1830s. While the Rozvi past has been well documented historically, their association with Khami-phase sites that are also linked to the Torwa has never received adequate archaeological attention [11,36,37]. The above interactive statement challenges the principal statement about the phenomenon of interest. Specifically, it cast doubts whether the Khami-phase sites developed as part of the nearby Leopard's Kopje cultures or Torwa and Rozvi dynasties as influences by their link to Great Zimbabwe. More visibly, the interactive proposition uses the following key words: "It, however, remains difficult", "but" "Furthermore, it remains unclear." Accordingly, the interaction between the principal and interactive proposition in this example creates an anomaly, controversy or gap where despite their documentation, the association of the Rozvi with Torwa related Khami-phase sites has never received adequate archaeological attention or scholarly attention.

Speculative proposition: In view of these questions and the historical background of Khami-phase sites, there is need to reanalyze the archaeology of these sites to explain social change processes through the aid of relevant oral traditions, contextualized material culture and dating samples. Until today, the archaeological details regarding chronology, occupational sequences, economic and political status of Khami-phase elite sites remain fuzzy if not controversial. Archaeologists still lack basic or primary information about processes that led to the rise of complexity in south-western Zimbabwe. Therefore, through the carrying out systematic excavations and detailed analysis of material cultural finds, our interpretation of the rise and development of complexity for Khami-phase sites may be greatly enhanced. Finally, the speculative proposition building on the principal and interactive propositions to set the direction of the research inquiry, and specify what should be done, derived or is required from the study. In this case, the systematic excavations and detailed analysis of the material cultural finds to enhance our interpretation of the rise and development of complexity for Khami-phase sites. Naturally, this leads to a statement of purpose and research question(s).

Conclusion

We started by agonizing over the challenges faced by novice researchers, especially young scholars doing their honors, masters, and PhD theses or dissertations, in understanding and operationalizing a research problem statement or statement of the problem. Accordingly, we addressed these challenges by first providing a conceptual understanding of a problem statement. Second, we proposed a methodological framework to operationalize a research problem based on Clarke et al. [10]'s principal, interactive, and speculative propositions. We further argued that they, respectively, enable a researcher to position the phenomenon of interest in a broader context, define what is known about it, identify the gap(s) that exist, and specify what must be done or is required from the study. Hence, the problem statement is the most critical component of research and is often found at the core of any research or study. Third, we provided an example of a research problem statement based on the work of Machiridza [11], specializing in the field of historical archaeology.

Our paper makes a theoretical and practical contribution. Thus, theoretically, we extend the existing knowledge on the conceptual understanding of a problem statement based on Clarke et al. [10]'s three propositions: principal, interactive, and speculative. Specifically, our contribution is that while the literature on a problem statement is vast [4,7-9], unlike Jacobs [8], we highlighted the interaction between the principal and interactive propositions and illustrated how it creates the research problem to be addressed. Equally, we provided a practical tool for novice researchers with an easy-to-follow example. However, we caution that while our paper provides a general guideline, it uses an illustration from archaeological research, and, therefore, it is not a theory of everything. There may still be a need to adapt it, as problem formulation may differ from one field of study to another [38,39]. Also, we did not dwell much on the aspect of a literature review, which forms an integral part of problem formulation, nor on the statement of purpose and research questions that come after it. We leave these tasks to other researchers and future research.

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