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Triangulation in Research

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Research triangulation, over the years, has gained much popularity as researchers become more sophisticated in generating and testing theories. Indeed of what use is research whose findings are unreliable and invalid? Answers to research questions are expected to be as close as they possibly can to the reality if they cannot be perfectly accurate. Researchers find a way of producing reliable results by making use of research triangulation. This paper seeks to identify advantages that come with a researcher making use of research triangulation in a study.

According to Noble and Heale (2019), research triangulation refers to the process that helps to increase the credibility and validity of research. In other words, research triangulation basically aims at validating the results of a study. Triangulation, sometimes, makes use of mixed methods to achieve the aim of validating research findings. However, triangulation is not the same as mixed methods. Mixed methods basically combine quantitative and qualitative research approaches in getting research questions answered; while triangulation describes how the researcher makes use of all the multiple approaches in the study to extract the required information as well as critically analysing findings (Social Sciences Research Laboratories, 2018); thus establishing validity and credibility.

Validity in research basically establishes how correctly a particular approach measures something and how closely findings are to actual values or concepts being examined (Noble & Heale, 2019). It indicates whether findings from a particular research can be trusted. Achieving validity is very important to ensure that findings from a research can be correctly used and interpreted in such a way that stakeholders of the study are able to make informed

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appropriate decisions based on research findings (Golafshani, 2003). Validity is also very critical in ensuring that findings from a particular study can be generalised to other geographical jurisdictions, populations, settings, conditions and times. It can be either internal or external or construct. Internal validity basically ensures that the researcher eliminates any form of bias likely to obstruct research findings (Onwuegbuzie, 2000). External validity can be grouped into population validity and ecological validity; where the former ensures that the sample for the study is representative of the population being studied and the latter ensures that findings can be applicable across different times and settings (Onwuegbuzie & Johnson, 2006). Construct validity ensures that the method of measurement implored for the study are suitably matched to indicators associated with the concept or characteristic being studied (Middleton, 2019).

It is in the quest to achieve validity and credibility in research that researchers make use of triangulation. Social Sciences Research Laboratories (2018) exposes six ways researchers can achieve this; thus methodical triangulation, data triangulation, investigator triangulation, theoretical triangulation, environmental triangulation and multiple triangulation. Methodical triangulation uses more than one research approach in a study and can be "across method" or "within method" (Risjord et al, 2001; Casey & Murphy, 2009; and Boyd, 2001). Methodical triangulation is also referred to as mixed methods research (Bekhet & Zauszniewski, 2012). Data triangulation makes use of several data sources in a study. Investigator triangulation uses different researchers, interviewers, investigators, data analysts or observers in a study (Bans-Akutey & Tiimub, 2021). Theoretical triangulation makes use of several theories in analysing a phenomenon (Hales, Peersman, Rugg & Kiwango, 2010). Environmental triangulation makes use of a variety of settings to validate research findings. Multiple triangulation makes use of two or more of the triangulation types (Social Sciences Research Laboratories, 2018). It is worth noting that all these methodical, data, investigator, theoretical, environmental and multiple triangulations require more resources in the form of time, energy and finances from the researcher. The researcher also has to know in detail how to effectively use these. Young researchers may therefore require some guidance from expert researchers to ensure the right thing is done thus achieving the expected results.

In as much as adopting research triangulation requires more resources from the researcher, there are invaluable benefits it presents which far outweigh the difficulties it presents. Some of these benefits are; aiding in the confirmation of research findings, improving on credibility and validity of findings as well as more comprehension of the concept studied (Redfern & Norman, 1994; Risjord et al, 2001; Foss & Ellefsen, 2002; Halcomb & Andrews, 2005 and Casey & Murphy 2009). The use of methodical triangulation helps researchers to minimise or offset the effects of weaknesses of the use of one research method with the strengths of other

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methods (Denzin, 1978; Sharif & Armitage, 2004).

In a study on the effects of moving to a new home, Bekhet & Zauszniewski (2012) make use of methodical triangulation to strengthen results owing to the fact that previous studies on the subject have provided questionable evidence. They therefore made use of quantitative and qualitative research approaches where questionnaires were used along with interviews involving open-ended questions. To ensure accuracy, "truth value", "applicability", "consistency" and "neutrality" as suggested by Casey and Murphy (2009), triangulation was used. Despite some challenges encountered in the study, benefits of triangulation as identified are discussed below.

The first advantage of triangulation is the fact that it helps to confirm research findings. When a researcher makes use of a variety of methods for instance quantitative and qualitative methods and is fortunate to have findings from all methods pointing in a particular direction, results are consequently confirmed. This confirms that work done is accurate. It must however be emphasized that the use of triangulation to confirm research findings does not mean collected data cannot be questioned. There is the need to always question collected data (Social Sciences Research Laboratories, 2018) to advance research and improve existing knowledge (Bans-Akutey & Tiimub, 2021). Nonetheless, quantitative data collected in a triangulation enable confirming of qualitative data when the triangulation is well planned end excellently executed by researchers who know exactly what they are looking for.

Secondly, when a researcher makes use of a variety of sources or procedures in a study, the deficiencies in one method is reduced by the strengths in the other method. For example when both quantitative and qualitative methods are used simultaneously in a study, thus imploring the use of mixed methods, the researcher is able to verify findings from qualitative data, investigate relationships as well as statistically represent findings while at the same time the researcher is able to easily comprehend the context of findings and understand difficult issues that arise from results of quantitative data. In such instances, quantitative and qualitative research approaches tend to complement each other.

The third advantage of triangulation is the fact that it provides more insights that help the researcher to better explain a phenomenon. In a case of theoretical triangulation, researchers are able to use two or more theories to explain research findings. These help the researcher analyse collected data against a number of theories for deeper understanding. It must be noted however that theoretical triangulation can be quite complicated and requires researchers to be well vexed with the theories being used for the study and how the theories are being applied. Nonetheless there is no single right way that triangulation is performed. Triangulation is carried out in the best way a researcher knows how to.

Fourthly, triangulation ensures that inconsistent data are easily noticed and possibly re-

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moved. This is not to say that a researcher can exclude some data at his discretion for a particular study, as that will not be ethical and may impact results of the research. However, in the case of investigator triangulation, where a variety of researchers, interviewers or data analysts are used, it becomes very easy to see conflicting data and eliminate them so they do not negatively impact the findings of the study. Errors are also easily noticed and corrected or removed completely.

Finally, triangulation helps to improve the credibility and validity of the study. Making use of multiple data sources reduces research biases in sampling, procedural bias as well as researcher biases thus increasing validity and credibility. Even in the case of conflicting findings during triangulation, the researcher is confident and can easily explain reasons for conflicting findings. Improving on credibility and validity of a research through triangulation helps to increase researcher's confidence. However, validity of every research cannot be 100% thus collected data can always be questioned (Social Sciences Research Laboratories, 2018)

To conclude, triangulation is mainly focused on validating the results of a study such that stakeholders who make use of the research findings take informed decisions. Validity which indicates how correctly a research method measures a phenomenon can be internal, external or construct. All three types of validity can be achieved by methodical, data, investigator, theoretical, environmental or multiple triangulations. Though triangulation requires much more resources from the researcher and also requires that a researcher knows exactly what they are doing, there are a number of advantages which make it appealing to researchers. Triangulation helps to confirm research findings, decrease deficiencies from one method or one source, provide more insights, quickly notice and eliminate inconsistent data, and increasing validity and credibility of the study. Ultimately, research triangulation causes researchers to be more confident of research findings.

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