Research Design

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Research Methodology and Design

Background

Right through the centuries, fundamental investigative arrangement have urbanized as models for every succeeding generation of information seekers. One who decides to investigate a meticulous idea inside an individual's field might appear to the significant progress of investigative methodology in that field to direct him/her in developing a suitable protocol of research. In spite of the field of study, the potential researcher will find that scholarly investigation is guided by two overarching systems of inquiry quantitative and qualitative research methodologies. Both are viable avenues of study that address inquiry in multiple disciplines. However, they are guided by different principles and are, therefore, best applied when matched to the characteristics of the problem that is to be studied. Research Methodology became a feature of Universities of Technology in South Africa, in the mid 1990's with the introduction of the Bachelors degree in Technology. Every student had passed this course.

In the faculty of Commerce, the first six students were subjected to this course through a process of lectures only. A local text was prescribed, and the introduction of the course started with the difference between quantitative and qualitative studies. The ideas of modernism and post modernism and all the theory that the lecturer thought a complete course should have (Royal, 1996). The results were poor as there was too much to remember and no context within which to place their knowledge. Thus, a process was started to turn this subject around. The existing texts were of little help, and so it was that like the College of William and Mary, a process of discovery was initiated to create students interest in the subject and allow them to benefit more from the experience. At the end students had to be able "to do", and what better

way, than to learn by doing. Enjoyment was also a factor that needed to be considered so as to assist in the development of the higher degrees in the university because the university depended on these students returning for study further (Nabigon, 1999).

Introduction

An agenda based investigative proposal or arrangement, is a widespread explanation of a prospective study that is projected to scrutinize a phenomenon in inquiry. The major intention of investigation is the enhancement of information, either in a precise punitive field or the practice of a specialized field. Research is typically linked with a intended, methodical study that manufactures essentials and thoughts that add to individual consideration, evidence, and acts. Since there is no particular method in which to move toward research, an inquirer ought to consider various factors in scheming an agenda based research plan. Post secondary institutions of education require that a proposal or prospectus be submitted, reviewed, and approved prior to over linking upon a thesis or dissertation study. This requires that the researcher complete a preliminary review of related literature and formulate a hypothesis or research question that will provide focus for the study. Following these initial steps, the remainder of the program research study is designed and defended as part of the approval process. This plan must also be submitted to the college or university's research department for approval through the institutional review board. The approvals process has many steps, but a fully developed, a well-designed plan saves time and effort in the long run; provides structure for the study; and normally produces a higher quality of research (McNaughton, 2003).

Evolution

Although the exact titles, formatting, and subsections may vary base upon the research design and researcher preferences, research plans, whether quantitative or qualitative in nature, have several elements that are commonly included in their designs. Both usually include introductory components that present the phenomenon to be studied, a review of relevant literature, descriptions of the research design and procedures, and discussion of the data analysis methods to be used within the study (McNaIIy, 2000). The model has settled down after 13 years of practice, to contain seven steps towards producing two crucial pieces of work which allow the student to develop skills in Research. After this, every faculty or department must put in place a second Research Methodology course that will take the student through the methods that are required in that discipline at post-graduate level. Every step results in a piece of work being submitted via email so that there is a record of it on both computers, as well as a date reference, and it is marked according to the prescribed rubric for the year. This is done because students lose the electronic copies and do not keep hard copies. The work would have been checked firstly by one of the three mentors chosen by the student in his or her community or one of his peers, depending on the situation.

This also allowed for the development of an academic network of persons who could work together and enhance their own research skills. Some of the students worked in situations where the skills were freely available, and they had only to submit after step 3 so that the lecturer had control over the work before data was collected. The final pilot study also had to be submitted and the report return before the publishable paper was written (McCoy, 2007).

Quantitative Research versus Qualitative Research

Quantitative research methodologies are most often associated with scientific investigation of quantifiable properties and their relationships. It uses mathematical models, theories, and hypotheses to measure and portray the empirical associations found in natural phenomena. It is frequently the research methodology employed for inquiry in natural science and social science fields such as physics, biology, psychology, and sociology. Characteristically, quantitative methods use large, random samples from which to gather data, and they require that the researcher remain in a neutral, interactive role so as to remove any bias that could affect the outcome of the study (McAlpin, 2008). Data are often numerical in nature, collected using reliable and valid tools and methods, and analysed using statistical techniques. Results and findings are methodically presented following statistical data analyses, focusing on deductive, logical reasoning.

Qualitative research methodologies provide a means of gaining deeper understandings of human behaviours and the factors that influence those behaviours. The nature of human interactions is dynamic and may be reshaped by myriad factors. Therefore, qualitative methodology offers multiple means of inquiry that are flexible and adaptable within a more fluid research protocol. In essence, the researcher does not present a typical hypothesis at the onset of the study. Instead, he or she develops the research questions and focus during the study (Kovach, 2009). The questions and focus of the study may change, as the researcher investigates and collects data for the project. The broad range of human behaviours dictates that qualitative research use smaller samples in order to limit the scope of a study, and allows the inquiry to focus more deeply on the phenomena to be examined. Unlike quantitative research, qualitative

research is often subjective in nature, relying on interaction between the researcher and study participants.

Qualitative Research

Qualitative data are characterized by their descriptive qualities, collected through personal accounts and interviews. Instead of using statistical analysis techniques, the qualitative researcher investigates patterns and common themes within the data. Study results are written in narrative form, using inductive reasoning to present findings (Kovach, 2005). Both research methodologies offer advantages and disadvantages; therefore, the researcher must look at focus and purpose of his or her inquiry to determine which methodology is the better match for a proposed study.

Quantitative Proposed Program

The choice of a quantitative research design requires the researcher to formulate an initial, specific hypothesis that will serve to guide the study. Thought and planning must be incorporated into the development of instruments and methods for measurement. Variables must be identified, and their control and manipulation must be factored into the research design. Selection of a quantitative research methodology brings with it structure and format that are commonly accepted (Hart, 2009).

Approaches to a Quantitative Research Plan

Quantitative research is the method of choice for a researcher who seeks to clarify phenomena through specifically designed and controlled data collection and analysis.

Experimental Research

Identifies at least one independent variable for interventions and is manipulated, whereas other, related variables are controlled; effects on dependent variables are observed (Example measuring student achievement levels by examining and controlling selected variables such as age, grade level, reading level, time, teacher characteristics, etc.); two subgroups fall within this category: true experimental and quasi-experimental research (Gross, 2002).

True Experimental Research

Participants are randomly selected and placed into control and experimental groups prior to the intervention; the experimental group receives the intervention and the control group does not; random selection and placement of the participants allows the researcher to control for extraneous variables; this method provides for true causal relationships between independent and dependent variables (Graveline, 2000).

Quasi-Experimental Research

This type of research is used when the researcher cannot or should not randomly assign participants to control and experimental groups; lack of random, assignment limits the researcher's ability to control for extraneous variables; results should be interpreted cautiously; these types of designs cannot prove cause and effect, although they can show relationships between variables.

Correlation Research

Seeks to examine the degree of relationship that may exist between two or more variables in a single group of participants through the collection of relevant data; this type of research cannot positively identify cause-and-effect relationships because of a lack of random selection and assignment of participants, and because of a lack of variable manipulation; lack of randomization also limits the generalisability of results (Goudreau, 2006).

Causal-Comparative Research

Investigates the causes or consequences of existing differences in groups of individuals; may also be referred to as ex post facto research due to the nature of dealing with groups that have already been established (example, whether students whose parents have attended college enter post secondary education at a higher rate than students whose parents who have not attended college); because the events have already occurred, variable manipulation is impossible; results must be interpreted with caution and generalisability is limited (Geniusz, 2006).

Survey Research

Collects descriptive data from a targeted population in order to determine the current status of one or more specific variables (Example the status of health care in a given community); questions are not standardized, which may lead to issues with instrument validity and reliability.

Components of a Quantitative Research Plan

For a solid proposal, the researcher needs to write in such a way that the study can be envisioned by the readers. The proposal should be clear and concise, with attention to detail. The following subgroups represent the sections of a written plan for conducting quantitative research. Although the subtitles may not be the same for every proposal, this information serves as an outline for developing the plan of research. The researcher will need to determine the exact subgroups and titles based upon research methods and type of study being conducted (Fixico, 2003).

Introduction and Statement of the Problem

When writing a quantitative research plan, the researcher must first set the scene for the project. The introductory section of the plan allows the researcher to discuss the framework for the project, as well as provide vital background information. The researcher wants to draw in the audience, creating interest and intrigue. In this section, the researcher discusses the topic that is the focus of the research, including its importance to the advancement of knowledge in the particular field of study.

Statement of the Hypothesis

As mentioned previously, current literature and research trends should help the researcher determine the basic research questions and goals of the study. The literature review should guide the researcher in formulating the hypothesis or hypotheses for the project. The statement of the hypothesis in a quantitative research proposal should be succinct and include the variables upon which the study will focus. In the proposal stage of the study, it is not always necessary for the

researcher to know what type of effect the variables will have on one another. However, it is essential that the researcher defines clearly and operationally any variables that will be manipulated in the proposed program of study. In addition, if several research questions and/or hypotheses will be examined, all of these should be listed as part of this section. The final statement of the hypothesis or hypotheses must be written in such a way that anyone reviewing the proposal knows exactly what will be studied.

Methodology

The methodology section of the proposed program of a quantitative study describes exactly how the research will be conducted. The researcher needs to include methods involved in selecting participants, any instruments that will be used in the project, and the general research design.

Selecting Participants

When formulating a quantitative research proposal, the researcher needs to include a detailed section on how participants will be selected. The researcher must also describe pertinent demographic information regarding the selected participants and the overall pool from which the participants are being chosen. The researcher must include the type of sampling procedures that will be used to select the participants, as well as how many participants will be included in the project.

Instruments

The researcher should discuss any data collection tools that may be used in the study. Instruments must be described clearly, and the researcher should specify how each will be used. In this section, it is essential to indicate which are present instruments, as well as which instruments will be developed by the researcher. It is also appropriate to discuss the validity and reliability of instruments, details of how the instruments will be administered and scored, and why the specific instruments were selected or developed for the study (Castellano, 2004). Because this is the proposal phase of the study, the researcher may not have all of the data collection tools selected or developed at the time of submission.

Research Design

The research design outlines the framework for how the study will be conducted, including the research goals and questions that will be answered through the study. The goal of quantitative research is to examine relationships among or between variables. Several designs accomplish this objective as mentioned previously, including experimental and quasi-experimental, correlation, and causal-comparative research (Archibald, 2008).

Validity

While reliability referred to the constancy and repeatability of the instrument, validity considers the ability of the instrument to accurately represent the characteristics of a phenomenon. Validity could be considered from three perspectives: “content validity, criterion-related validity, and construct validity”. Content validity is primarily concerned with the samples and instruments used in the study and addresses the extent to which ensures that the phenomenon

is explored in sufficient detail. Criterion-related validity refers to comparing of the method and findings of the study against an "established standard". Construct validity is a function of the closeness of the instrument to the construct being studied.

Ethical Considerations

In addition to obtaining a signed consent form prior to conducting the survey; the researcher would take steps to make sure that "genuine informed consent" has been granted by the respondents. To accomplish this objective, information regarding the nature of the study would be presented prior to conducting the survey. Additionally, the respondents would be informed that a debriefing session would be held at the end of the survey to allow the participant to reflect on their answers and clarify anything that they believe might be inaccurate or incomplete.

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