Conducting Case Study Research

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LEARNING OBJECTIVES

1. Describe when the case study approach is the most appropriate qualitative research method.
2. Outline the components of a case study research method.
3. Discuss data coding and analysis and how categories and themes are developed.
4. Identify considerations for reporting the findings of case study research.

INDEX TERMS: Case study research, qualitative research methods, data coding, data validation

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INTRODUCTION

As medical laboratory professionals, we compare patient results to reference ranges and determine the clinical significance of the findings. Those numbers indicate whether a patient is healthy or will be diagnosed with a disease process. Even after the diagnosis, the numbers still have meaning as they reflect the outcome of the treatment. The result of the analytical process provides the healthcare team vital information regarding diagnosis and treatment. Because of the nature of our profession, quantitative research may be more readily accepted. We incorporate the results of quantitative research when we consider the likelihood of developing the disease, treatment success/failure rate, and prognosis. However, do we ever consider "how" the patient reacts to the diagnosis or "why" some patients have a better prognosis than others?[1] A quantitative research method would not provide the data needed to respond to those questions. Therefore, we should consider conducting a qualitative research method.

As previously identified, there are five approaches to qualitative research methods: narrative inquiry, phenomenological, grounded theory, ethnographic and case study research.[2] It is vital that the researcher consider the research questions and research design so the appropriate qualitative research method is selected. Qualitative research methods are used in psychology, sociology, philosophy, political science, medicine, social science, anthropology, government, business and education.[1,3,4,5] Let us explore in more detail the case study research method.

Case study research is an "…intensive study of a single case where the purpose of that study is… to shed light on a larger class of cases."[4] Being of an exploratory nature, case study research results in hypothesis generation versus hypothesis testing. The findings provide a deep scope of proposition through concentrated data. Evidence from case study research supports a firm causal effect.[4]

Purpose

In case study research, the researcher can expect "… [an] intensive analysis and descriptions of a single unit or system bounded by space and time."[5] The purpose of conducting case study research is to provide "… in-depth understanding of situations and meaning for those involved."[5] Case study research is defined as the study of a "case" – a single individual, a situation, an organization, or a phenomenon. The study is conducted in the natural setting and is bounded by time and space.[3] When conducting qualitative research, "the researcher is the primary instrument for data collection and analysis."[5]

The five different applications of the case study research method include "to explain the presumed causal links in

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real-life interventions; to describe an intervention and the real-life context; to illustrate certain topics using a descriptive mode; to explore situations in which intervention has no clear set of outcomes; and to conduct a meta-evaluation."[1] Furthermore, as indicated with case study design, "The interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation. Insights gleaned from case studies can directly influence policy, practice, and future research."[6]

When designing case study research, one must consider the knowledge and skill of the researcher, a well-defined research question, the information that is available in the literature, the identified case, the data collection protocols, the data coding and analysis strategies, and the method of reporting the findings. The process is of an exploratory nature where data codes are used to develop categories which are then used to formulate themes. The themes are considered findings and are used to answer the research questions.[1,3,7]

I utilized the case study research method to investigate and document career paths of women clinical laboratory scientists that have transitioned from the clinical setting to the higher education arena and held an administrative position at the dean's level. The findings identified the experiences, training, obstacles, and opportunities that directed and influenced the career paths of these women.[8]

A case study researcher is committed to spending extended periods of time in the natural setting. Data coding and analysis also require extensive time on task and knowledge of the complex coding process. Cognitive skills identified as necessary for case study research include induction, deduction, synthesis, evaluation, and logical and critical thinking.[7] Being organized, possessing perseverance, dealing with ambiguity, being flexible and creative, utilizing rigorously ethical standards, and having an extensive vocabulary are skills best suited for the data coding process.[7] Because case study research does not have well-defined guidelines, the researcher must contend with the evolving and changing procedures.[3]

A thorough review of the existing literature assists the researcher in defining the research question. The researcher identifies the known and unknown and is able to note the weaknesses and strengths of the previous work.[5] Additionally, the literature review assists in determining the method of reporting the findings of the study. My literature review revealed that most higher education administrators were men. However, if a woman held the position of a higher education administrator, particularly of a college of allied health, their academic background was nursing. The lack of information regarding women clinical laboratory scientists who held positions as higher education administrators supported the need for the case study research.

The case is defined as an individual, organization, event or entity. It is important that the researcher identifies the characteristics of the case to be studied. The participants constitute a purposive sample as they must meet characteristics identified by the researcher. In case study research, the case number is often less than 12 and may even be a single case.[4] The eight participants of my study were female clinical laboratory scientists who held the position of a higher education administrator and resided in the Midwest region of the United States.

Data Collection

Yin (2014) identifies six sources of evidence: documents, archival records, interviews, direct observation, participant observation, and physical artifacts. However, interviews, observations and documents are the most common sources of information.[3] When conducting interviews in case study design, asking "how" and "why" questions provide the opportunity for participants to tell their story in their own words.[1] After explaining the purpose of the research and obtaining consent from the participant, the interviews can be conducted. A semi-structured interview protocol with probes and follow up questions was developed. The researcher becomes a listener in the interview process and acts to reduce any researcher bias. Audio recorded documentation of the interview results in a verbatim transcript. Examples of additional documents included participant curriculum vitas and demographic information. Field notes written by the researcher provide a source of additional data noting observations of the setting and the participant.[10] Observations of the university, the participant's office and my first impression of the location were included in my field notes written the day of the interview.

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Data Analysis

Ten open-ended questions were used for the semi-formal interview format. The verbatim transcripts from eight participants resulted in hundreds of pages of narrative. "Coding is just *one* way of analyzing qualitative data, not *the* way."[7] Coding of the data can be performed manually or with the assistance of computer software. I elected to code the data using the manual method. The format of the transcripts included a wide right margin for my written codes and notes. Reading the transcripts multiple times and reflecting on the meaning of the statements resulted in reduction of the data and identification of key words and phrases. "A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data."[7] This is often referred to as the open coding process.[2] Coding is the "critical link" between data collection and the explanation of the meaning.[7]

In my study, gathering and sorting of key words and phrases resulted in 80 pages of data. To group the data, I needed a visual display so the information was transferred to four large poster boards. After further synthesis of the data, a total of 33 codes were identified. As the codes were assembled and reassembled, axial coding occurred as categories began to emerge around a core phenomenon.[2] Nine categories were noted. After completing the selective coding process, the final research themes were developed from the categories. The data collection and analysis strategies resulted in three major themes. See Figure 1. To ensure high quality data analysis, consider the following attention to all data – don't ignore parts or pieces, address all plausible rival interpretations, focus on the most significant aspect of the case study, and use one's prior, expert knowledge as the data is considered.[9]

Data Validation

While it is difficult to generalize findings from a qualitative research project, the researcher must ensure the validity of the data analysis. Strategies to validate the study include triangulation, member-checks, rich-thick

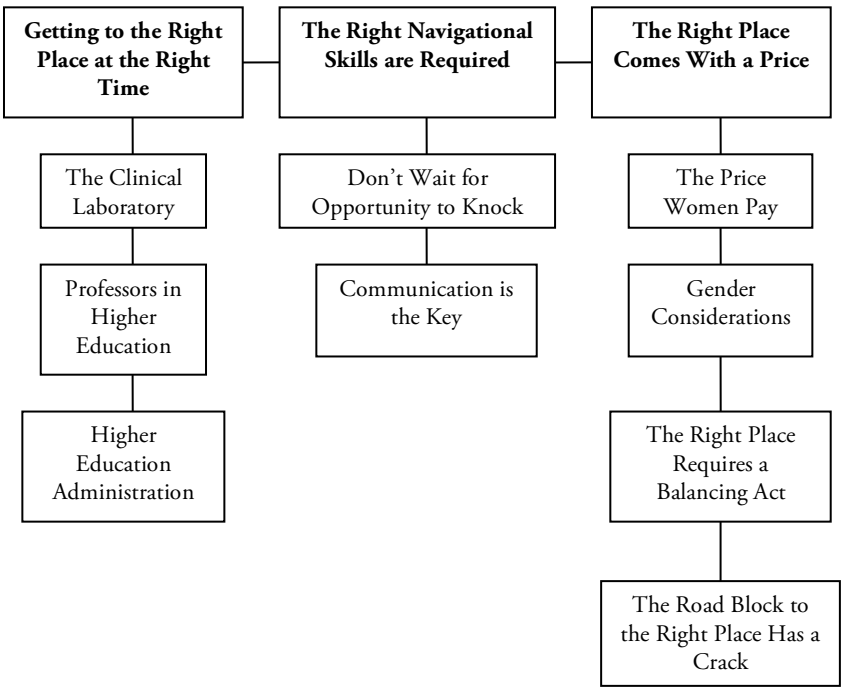

Figure 1. CLS to Higher Education Administrator Research Themes and Categories

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descriptions, clarification of researcher bias, evaluation of negative/discrepant information, and an external auditor.[3,6] The validation methods that I selected included member-checks, rich-thick descriptions, an external audit and awareness of bias. The transcripts were returned to the participants for review and additional information needed for clarification. I used rich-thick descriptions to report findings in such a manner that allowed the reader to be present in the setting.[2] An experienced external auditor was employed to review the IRB approval letter, all correspondence with the participants, the informed consent form, the transcript verification form, interview transcripts, coding key and a draft of the findings.[3] My researcher bias was fully disclosed and monitored so as not to influence data interpretation.

Data Results

Once the themes have emerged, the researcher must consider how best to articulate the findings and who will compose the audience. A few examples of ways to disseminate the findings include an oral presentation to a doctoral dissertation committee or at a professional conference, a publication in a scholarly journal, or even a theatrical performance.[5] For most researchers, the written format is the selected method. However, for some, writing up the findings can be as challenging as conducting the case study. It may help to consider this as a composition versus a written report. Additionally, beginning to draft the composition with the "when" and "how" sections even before the data collection and analysis is completed may be helpful.[9] During the initial steps of the research design, it is helpful to be thinking of how best to distribute the findings of the study. The researcher should be aware that case study reports tend to have a larger number of audiences than other forms of research because the findings can be presented in multiple ways.

Finally, it is important that the findings of the case study research be a significant contribution to knowledge or practice, must be complete, must consider alternative perspectives and must be composed in an engaging manner.[9] To do so, my research findings were reported using rich-thick description including quotations of the participants when appropriate. An example of listening as a communication key was expressed by one participant in these words:

> I don't think I can be the best advocate for people if I don't understand their programs or their positions… hear their concerns. I also think that when you're at the dean's level or associate dean and really even at the chair level, you need to hear the concerns of the people under you. Even if you don't agree on the outcome or agree with everything, it is important that you hear that. I think to communicate means to be able to not only be articulate in talk but to have very good listening skills.

Limitations

One of the challenges of conducting case study research is the identification of the case.[2] The researcher must make decisions related to the definition of the bounded study and the size of the purposive sample population. Most case study designs consist of a small sample population, thus limiting the ability to generalize the findings to a larger population. Because the researcher is a vital component of case study research, researcher bias must be recognized and handled in an ethical manner.

CONCLUSION

Case study research is one method of conducting qualitative research. The case is defined as an individual, an organization, or an entity and is bounded by time and space. The researcher is the primary instrument in case study methods; therefore researcher bias should be recognized and minimized as much as possible. Case study data is collected via observations, interviews and documents. In this example, semi-structured interview questions with probes and follow up questions were designed to allow the participants to tell their story such that the role of the researcher was as a listener. The interviews were audio recorded and transcribed to provide a verbatim transcript of the interview. After the field notes and transcripts were reviewed multiple times, key words and phrases were noted. From this information, codes, categories and themes were developed and reported as findings to support the research questions.

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