The Effective Use of Qualitative Methods in Establishing Best Practices in an Academic Bridge Program

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ABSTRACT

In recent years, academic bridge programs have received favorable attention as they support and guide targeted populations toward specified educational goals. However, critical, in-depth studies of such programs are lacking. This paper describes the techniques used to better understand one such bridge program: ‘Significant Opportunities in Atmospheric Research and Science (SOARS).’ The goal of SOARS is to increase the number of people of underrepresented populations in graduate programs of atmospheric and related sciences. Specifically, this paper will address how qualitative methods were used to establish the best practices of SOARS. Best practices are the characteristics that appear to help the program to reach its goals and objectives. The decision of what qualitative techniques to use was determined by reviewing the qualitative literature and considering the setting, the subjects, and the longitudinal nature of the SOARS program. Data collection involved participant observation, interviews and field notes. In addition, various written materials such as the subject’s research papers and electronic mail communications were also used as data. Using these methods allowed for triangulation and comparison of subject responses. From this research, it is apparent that qualitative research, as an approach for gathering and interpreting data that emphasizes description and the study of peoples’ understanding, is an effective way to analyze the best practices of the academic bridge program SOARS.

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INTRODUCTION

During an orientation meeting for Significant Opportunities in Atmospheric Research and Science (SOARS®), a diverse population of students was asked to describe the stereotypes of a scientist. The students generated a list that described a scientist as being hard working and intelligent, weird, interested in what they do, and generally a white, balding male. In truth, these students were fairly accurate in their view of a scientist. African Americans, American Indians, Hispanic and Latino Americans, and women have been underrepresented in the sciences for many years. Programs, such as academic bridge programs, are needed to increase the diversity in the scientific community, which in turn will increase the diversity of scientific ideas and approaches. Ultimately, these programs might end students’ stereotypical view of scientists.

Bridge programs support and guide students towards specified educational goals. If bridge programs are going to be used to increase minority representation in the atmospheric and related sciences, a thorough understanding of such programs is desirable. SOARS is an example of an academic bridge program. SOARS was developed in 1995 as a partnership between the University Corporation for Atmospheric Research (UCAR) and the National Science Foundation Atmospheric Science Division (NSF-ATM). The primary goal of SOARS is to increase historically underrepresented populations in the graduate programs of atmospheric and related sciences. It was determined that a critical review of SOARS, based in sound research methodologies, was needed to establish the best practices that could be used to develop similar bridge programs at other institutions.
An open-ended exploratory approach will be used to better understand SOARS in its entirety. This study will provide a rich description of the fundamental properties of SOARS and how the people within this program respond over time. The study intends to include the experience of current and past proteges, mentors, and program management. Data collection and analysis will take place over the course of two summer sessions and the intervening academic year. This paper addresses the qualitative methods used in the review of SOARS.

METHODS

Overview of Qualitative Research

The research tradition used to study the best practices associated with SOARS is qualitative. McMillan (1996) writes that, “Qualitative research stresses a phenomenological model in which reality is rooted in the perceptions of the subjects” (p.10). Qualitative research was developed from ethnographic research performed by anthropologists. Ethnography involves developing a detailed description of the naturally occurring behaviors found in a culture. According to Borg and Gall (1989), “Qualitative research methods are largely subjective in that they rely heavily upon the investigator’s skills of observation and interpretation to provide valid information” (p. 379). There are many characteristics of qualitative research such as researching in natural settings, direct data collection, rich narrative descriptions, using process oriented, inductive data analysis, participant perspectives, and emerging research designs.

Natural settings means studying behavior as it typically occurs. It is important that external constraints and controls are not used to manipulate the environment of the participating subjects because this would impair the interpretation of what naturally
happens in the program environment. The context of the situation is very important to understanding the behaviors so the researcher must enter the location without changing it to maintain the integrity of the culture. According to Bogdan and Biklen (1992), the researcher collects data on location and supplements the data “by the understanding that is gained by being on location” (p.29).

Data collection is another important component of qualitative research. Direct data collection, in which the investigator acts as an observer in the setting where data is collected, is a common characteristic of qualitative research. Frequently, the researcher has direct interaction with the participants, and sometimes the researcher may even take on the role of a participant observer where he/she participates as a member of the group, but is known as a researcher.

The data that is collected in qualitative research is often in the form of a rich, narrative description using words, pictures or video. Nothing is considered trivial or unimportant in the research. Interviews that take place are transcribed and the researcher may ask the participant for their opinion about the accuracy of the transcription. Borg and Gall (1989) state, “Because the qualitative researcher usually attempts to reconstruct reality from the frame of reference of the subjects, it follows logically that the respondents may in some cases be better able than the investigator to understand the complex interactions that have been observed and account for the influence of local values on these interactions” (p. 386). The investigator might also use field notes, personal documents, memos or other official records to gain a thorough understanding of the interactions that occur within the environment. According to Bogdan and Biklen (1992), “The qualitative research approach demands that the world be approached with
the assumption that nothing is trivial, that everything has the potential of being a clue that might unlock a more comprehensive understanding of what is being studied” (p. 30). It is important that every detail be described as accurately and as detailed as possible to allow this method of data gathering to be successful.

Another distinguishing characteristic of qualitative research is that the methods require the researcher to look for the process through which behavior occurs rather than simply the outcome or product. The investigator constantly asks how and why behavior occurs in what McMillan has termed a “process oriented” (p. 240) approach.

Qualitative research does not establish hypotheses at the beginning so data can be collected to prove or disprove them. Instead, the data is gathered first, analyzed for understanding of the situations, then formulated as a theory. This is inductive data analysis. Bogdan and Biklen state, “Theory developed this way emerges from the bottom up (rather than from the top down) from many disparate pieces of collected evidence that are interconnected” (p.31). Both McMillan (1996) and Bogdan and Biklen (1992) describe this as a funnel-like process where initial questions result in broad data collection open to many directions. The researcher then uses the attained information to develop more specific questions to shape the study. In this way, the investigator uses the study to figure out what the important questions are. This is an emergent research design. Gaining the participants’ perspectives is probably one of the most crucial components of qualitative research. The goal of the investigator is to reconstruct reality as the participant sees it so that the participant’s perspective is understood. As stated by McMillan, “This emphasis has been termed a phenomenological perspective. A phenomenological framework is one that focuses on the meaning of events and actions as
expressed by the participants. This approach acknowledges that there are multiple ‘realities’ as different people construct meaning from the same event” (p.240-241). The researcher analyzes all information to see how the participants make sense out of their experiences. The goal is to understand the inner dynamics of situations that might otherwise be invisible to an outside observer, and to make sure that the recorded perspectives are accurate.

**Participant Observer**

The main objective of the participant observer is to understand the setting, the participants, and their behaviors. “Participant observation ranges across a continuum between mostly observation to mostly participation” (Glesne & Peshkin, p. 40). As a participant the researcher has complete involvement while as an observer there is passive understanding without becoming part of the process. The participant/observer manages to both participate and observe in order to understand the dynamics of the environment that is being investigated. A continuum is used to describe this process because the degree to which one participates or observes depends on the situation. Sometimes the researcher will need to more actively participate than observe, while other times there will need to be more observing and less participating. Usually, the researcher starts somewhat detached from the subjects being investigated and works to develop acceptance. As the relationship grows, the investigator then participates more frequently. According to Glesne and Peshkin, “The more you function as a member of the everyday world of the researched the more you risk losing the eye of the uninvolved outsider; yet, the more you participate, the greater your opportunity to learn” (p. 40). The researcher must remember that he/she is not in the setting to teach or evaluate, instead he/she needs to be open to
changing his/her point of view and constantly analyzing his/her observations for
meaning.

The advantages of being a participant observer are substantial. One benefit is that
the potential for being distracting and intrusive to a point where the researcher inhibits
the participants’ behaviors is minimized when he/she takes on the role of an insider.
“Participant observation provides the opportunity for acquiring the status of ‘trusted
person.’ Through participant observation—through being a part of a social setting—you
will learn firsthand how the actions of others correspond to their words; see patterns of
behavior; experience the unexpected, as well as the expected; and develop a quality of
trust with your others that motivates them to tell you what otherwise they might not”
(Glesne & Peshkin, p. 39). Being a participant observer allows the development of richer
interactions with the people in the setting that might not have occurred if the researcher
were only observing.

There are some limitations to being a participant observer. If the researcher
overparticipates or is in the setting for too long this could lead to “going native” which
according to Bogdan and Biklen (1992), “occurs when the researcher gets so involved
and active with subjects that their original intentions get lost” (p. 88). Another problem
can occur if the researcher becomes so identified with a group that it inhibits interaction
with other groups or it is perceived that the researcher is taking sides. In addition to these
problems, the researcher can experience role conflict, which as Vierra and Pollack (1992)
state, “means that tensions and confusions exist in their respective roles of researcher and
participant” (p. 225).
**Interviews**

The purpose of the interview is to gather descriptive information using the subjects’ own words. This allows the researcher to understand how the participants interpret their own world. The structure of the interviewing process can vary. Generally, the process begins with small talk to make the situation comfortable and to develop rapport. Next, the researcher informs the subject of the purpose of the interview and makes assurances that the interview is private and that if they are uncomfortable with any questions they are not required to respond. Finally, the interviewer focuses on asking questions about the particular topics that are being researched.

There are advantages and disadvantages to the interview process. One of the benefits is that interviews allow the researcher to gather information about events that occurred in the past, or they can be used to learn about future behavior. It allows the researcher to learn about subjects’ opinions, perceptions, and attitudes. The interviewer can adapt to the responses of the participants and alter the course of the interview, which allows the investigator to follow-up on leads and obtain more data and greater clarity. One of the biggest advantages is that information that would not normally be revealed under other circumstances can be revealed by an interview.

There are criticisms of the interviewing process. Sometimes interviews are used to collect quantitative data that could be measured more accurately with other methods. In addition, it is believed that many interviews are shallow and fail to probe deeply enough to obtain a true picture of opinions and feelings. Another problem is that the researcher may subject the interview to his/her own biases by seeking out answers that support his/her own preconceived notions. Finally, there is the tendency that the
respondent may give inaccurate or incorrect response. This error where there is a
difference between the answer given by the respondent and the true answer is a response
effect.

Field Notes

Field notes are descriptive, written accounts of what the researcher sees, hears,
experiences and thinks while collecting and reflecting on data. The researcher must write
down notes that reflect his/her observations, participation and interview sessions in a
detailed, accurate and extensive form. “It is important to capture the characteristics of the
setting and the language and behavior of participants as they actually occurred.
Reproducing characteristics fully and accurately, conversations word for word, and
behavior fully and in chronological order takes practice” (Vierra & Pollack, 1992, p. 231).
Field notes can be hand written, but because it is impossible to observe and write at the
same time, observers write down a few words or sentences and then record their full
observations from memory a short time later. In an attempt to improve data collection,
tape recorders and video recorders may be used in addition to field notes to verify
accounts that were transcribed from memory.

Researcher Bias

As stated previously one type of bias, researcher bias, can occur when the
researcher seeks out answers that support his/her own preconceived notions. “Biases can
influence the work of even the most competent scientist” (Borg & Gall, 1989, p. 178). If
an investigator has an emotional stake in the outcome of the research it may be difficult
for him/her to remain objective. These situations should be avoided, but if they cannot be
avoided the researcher should have his/her design checked by several other researchers for unconscious biases.

Another type of bias, called observer bias, occurs because, “Human beings have a disturbing tendency to see what they want to see, hear what they want to hear, and remember what they want to remember” (Borg & Gall, 1989, p. 186). This type of bias is difficult to detect. Qualitative research, including interviews and observation studies are most susceptible to observer bias. This bias may occur in interviews where the questions lead the subject to a desired response or it may occur in methods of recording behavior where the researcher must observe and make inferences that reflect his/her own opinion. Finally, observer bias can also occur when the investigator knows the expected outcome of the research and unconsciously seeks to affirm that it occurs.

**DISCUSSION**

SOARS is best studied using qualitative research because there are many practices interacting and occurring simultaneously such that it would be impossible to distinguish causes and effects of each practice separately. In addition, because the proteges are in different settings conducting unique research it would be difficult to have prediction or control over each of them. Instead, it is better to study the program holistically. Qualitative research allows the investigator to provide rich narrative descriptions of phenomena that helps to increase understanding with words. How the data are gathered reflects the relationship of the researcher to the subjects. There is direct interaction between the researcher and the subjects whereby both parties influence each other and are interconnected. According to Borg and Gall (1989), “The goal of the (qualitative) research is to develop a body of knowledge that is unique to the individual
being studied, and that can be used to develop working hypotheses about the individual” (p. 384). This relates well with the goal of this study, which is to study the participants to determine the best practices of SOARS.

The goal of qualitative research is to develop understanding, describe multiple realities and capture naturally occurring behaviors. The data analysis is ongoing, inductive, and stresses themes and concepts. This seems a most appropriate way to study the academic bridge program SOARS, because there are many subjects (proteges, mentors and administration) who can share their unique understanding and experience with the program. To learn their views of the program from their experiences will lead to determination of the best practices. Using participant observation, interviews and field notes will allow the researcher to obtain understanding of the best practices from the perspective of the subjects. These techniques should allow for a much richer, descriptive understanding of the SOARS atmosphere than would be accomplished with surveys where a response is given as a rating on a Likert scale and no reason for why the response was selected is given by the subject. The techniques for data gathering in qualitative research make certain that the researcher gains the subjects’ perspectives for their responses. These techniques ultimately allow the researcher to have a better understanding for what the subjects feel the best practices of the program are.

CONCLUSION

In conclusion, the qualitative methods that will be most effective for studying the academic bridge program SOARS are participant observation, interviewing, and researcher’s field notes. These techniques coupled with reviewing the subjects’ responses and comparing and contrasting the data should allow the investigator to
develop an accurate understanding of the program’s best practices. Ultimately, qualitative methods will help to discover the characteristics of the program that are essential for meeting program goals and objectives as judged by the participants as they experienced these characteristics.

REFERENCES


