Research Methods

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Educational research is empirical in nature, and quantitative methods have historically been more highly regarded as the method used to conduct research, but qualitative is becoming more common throughout the current decades (Smeyers, 2008). Epistemology is the study or theory of nature and the grounds of knowledge and its reference to its limits and validity (Onwuegbuzie & Leech, 2003). Quantitative approaches were used in the physical sciences in the past, but researchers began to question whether this was the best method in order to study social or human issues. Researchers have an ongoing debate about which is the better method, and often they view themselves in competition with each other. There are advantages and disadvantages when using either method to conduct research, however, and the researcher’s evaluation of particular studies is needed in order to choose the best research design and method.

Before conducting research, one must decide the most practical method based on the field of study, the nature of the study, the purpose of the study, and the tools that are most available to them. Different methods should be chosen based on the field because experiments that incorporate human social behaviors in case studies, for example, lend themselves to qualitative methods; this is because individual human interaction is needed. Quantitative methods might be more advantageous, however, when raw data is needed for a scientific experiment that does not require input from human subjects or case studies about characteristics of humans’ personality, attitudes, and behaviors (Lunenburg & Irby, 2008). Debates centered on practicality and validity of research methods in the past, but focus in education is now shifting to the ability to use research results to help formulate policies and procedures for the betterment of educational practices. Both methods are explored with past and current beliefs, as well as the nature and types of quantitative and qualitative methods used. Both methods are used because of the desire to predict human behavior, but the methods and designs used, populations studies and desired implications and results are important factors to help determine the best method for the particular study (Onwuegbuzie & Leech, 2003).

**Quantitative Research**

**Description**

Researchers that believe quantitative methods are the best method to use subscribe to the positivist thought. Positivism is the philosophical movement that believes all meaningful statements are analytic or can be verified or confirmed by observation and experimentation (Keller, 1998). This method looks for a distribution of variables and for explanations that can be used to generalize for an entire population to explain what causes effects to happen (Smeyers, 2008). Advocates for this method of research believe there is less bias in the research because there is less interaction between the researcher and its subjects, and one can remain objective and follow the methodology of the study without too many variables that can change due to human error, miscommunication or misunderstanding. There is less interaction or immersion of the researcher with humans as opposed to case studies, for example, but the chosen quantitative method, as well as population, sample size and control variables, could also result in bias or leading results. Choosing the correct criteria to use in research is just as important for the validity of the research.

There are four categories of research for quantitative research. The first is descriptive design (important to educators because of its ability to produce basic information) which can include longitudinal studies (research measured across time) or cross-sectional studies (evaluating data from one point in time across different sections of the population). Correlation research evaluates the relationship between one variable and another and investigates the nature of the relationship in order to predict causality. Causal-Comparative is also used to determine cause and effect relationships, but they cannot have been manipulated, and results cannot have already occurred. Quasi-Experimental research allows for more control for validity with pretest and posttests designs (Lunenburg & Irby, 2008). All of these processes are primarily deductive and are used to test hypotheses that compose a theory. The processes are usually less in-depth than qualitative research methods, but there is more extensiveness of information across a large number of cases. Because statistical tests are used for analysis, the methods are reliable, but there is a greater dependency on the measurement device or instrument used as opposed to qualitative research that is dependent on the researcher, not the tool the researcher uses.

**Disadvantages**

As mentioned previously, the decision regarding which instrument or method to use for obtaining results in a quantitative study is very important and can be subjective in nature. A critical examination of the data used can help the researcher mitigate these worries and determine what the numbers reveal about any assumptions or bias the data collection process exhibits. There are also other arguments about the limits of quantitative research. These should be examined by researchers when determining the most productive and relevant method for study.

Another objection to quantitative studies is that they do not look at the individuals they are studying as people who make decisions and are shaped by their culture or social interactions. Instead, individuals are only evaluated as a unit of measure, and assumptions are made without regard to the independent thought or choice they make that could be used to predict or understand behavior (Keller, 1998). Another limitation is the thought that quantitative studies should only be used if data can be measured by numbers or results can be quantified. This can lead to an incorrect approach when evaluating which research method is used. A third critique or view of limitation is the dependence on the instrument or mathematics used to extract or evaluate data. Independent thought by the researcher is not needed when there is a system to evaluate and produce the results for you instead of analyzing the results individually and with great detail; results can be generalized incorrectly. The strictest complaint about quantitative research could be its assumption of measuring all individuals the same way (Keller, 1998). People are different based on experiences, backgrounds, intelligence, social influence and the ability to change their desires at any point in time. When a researcher assumes that a study conducted at a particular point in time can predict the results of diverse individuals capable of independent thought, quantitative studies shift from generalizable and useful to limited, incorrect and specific to one particular subset of a population.

 As mentioned previously, criticism exists regarding quantitative research methods being inefficient for formulating higher education planning and policy and decision making (Keller, 1998). Scientific results and descriptions of causality cannot help higher education leaders develop successful societies and create procedures relevant and productive for colleges and universities that serve a global, diverse, technologically advancing population. Martha Nussbaum is a critic of quantitative research and scientism, Keller (1998) reports, because of its ability to group individuals into unemotional creatures. There is a need in higher education practically to study the social influences of individuals, and quantitative research provides many limitations to that need.

**Advantages**

Although qualitative methods use observation methods throughout the research study, quantitative methods also involve the use of observations in order to address the research questions proposed. The use of formulating hypotheses allows the researcher to also speculate about what outcomes will exist and can contribute to the most applicable instrument used. Most researchers are also very cautious in incorporating safeguards in their research so they can minimize or eliminate pre-existing bias.

 The overall purpose of educational research is to explain and predict behavior or correlation between educational objects (Smith, 1983). Quantitative research excels in systematic data collection and analysis and with assortments of instruments and measurements to choose from; results can provide answers that are generalizable and useful to many different cases, institutions or individuals. Quantitative research methods also have the advantage of recognized criteria for assessment and validity. Because more research has been conducted by this method, it is hard to ignore its presence and strength in the educational field.

**Qualitative Research**

**Description**

Qualitative research investigates the characteristics and behaviors of individuals to better understand the cause of individual behavior and to use this data to explain the factors that are needed to solve issues. This method is primarily a more inductive process that is used to formulate a researcher’s theory on human behavior or action or to explore new perspectives on questions or information that has already been studied but not understood. “Qualitative research is *well* suited for the purposes of description, interpretation, and explanation” (Imel, Kerka, & Wonacott, 2002). Because human beings are different from physical objects, they need to be studied differently.

The type of method used depends on the type of question or problem that needs to be answered (Imel, Kerka, & Wonacott, 2002). There are several techniques or methods used in qualitative research that vary depending on the type of research question proposed. One notices, however, the involvement of the human subjects and how dependent the researcher is on the interaction or observation of humans in their research as opposed to the distance quantitative research can provide. Interviews are used to gather data about individual subjects as well as focus groups; focus groups are interviews but with a particular group that can be observed are interacted with. Direct or participant observation is used in order to obtain an in-depth understanding of the researcher’s subjects. Case studies are used to gather data about an individual or a group, culture or community. Ethnographic studies involve field work that places the researcher directly involved with the individuals or groups being studied (Lunenburg & Irby, 2008) Because of the more in-depth information obtained, the data’s validity and reliability depends on the skill and rigor of the researcher. Overall, qualitative research can be less generalizable to the greater population but might provide a more accurate description of individuals or groups.

**Disadvantages**

Because of the in-depth investigation and engagement with human subjects in qualitative research, dependency on the sample population can be a shortcoming of qualitative research. Not only is the researcher dependent on the human subjects for honest and valid information but the time and resources needed to collect and analyze the data obtained from them is time-intensive and dependent on access from others.

A critique of qualitative methods is the lack of objectivity that can exist with the researcher studying its subjects and the bias of viewing the world through the researcher’s thoughts, beliefs and values about the theory or problem being investigated. Because inductive reasoning is used in qualitative studies, inferences can be made and conclusions drawn incorrectly when making generalizations for an entire population (Sechrest & Sidani, 1995). Also, the mode of sampling is more often that of convenience in qualitative studies rather than random sampling because of the selected purpose and smaller sample size due to intensive in-depth study of the human subjects.

Another disadvantage for researchers using qualitative designs or methods is the lack of training or knowledge about the methodology of conducting research. Hutchinson and Lovell (2004) report that George Kuh has even noted that the use of journals as a source of current information in the education field can be limited by the training of the reader, and, therefore, journals with reported research are not useful. Higher education professionals’ ability to produce and comprehend research can impact the research itself.

**Advantages**

Qualitative data can help explain relationships in more detailed, individualistic ways that are discovered by quantitative data. Qualitative studies can help validate quantitative findings by investigating individuals’ behaviors and choices. There is a recognized need to study problems that are more relevant to policy makers in the institutions, and this would help close the gap that exists between research and practice by conducting more qualitative studies that investigate the needs of those individuals in our institutions (Bensimon et al., 2004). Qualitative studies can help bring about change in institutions and society because of the in-depth, personalized research that is conducted that helps examine specific issues that an institution, field or culture wishes to change or adapt.

 Successful and the most productive qualitative researchers must eliminate all bias and preconceptions, remove emotion from their interaction with their subjects, and move beyond common sense beliefs in order to eliminate criticism regarding validity from positivists (Creswell & Miller, 1997). When the researcher can conduct his evaluation and research with those three elements, a stronger advantage or perception of his research can be found. The more objective a researcher becomes, the more validity others in the field grant the research.

**History and Trends**

The shift in thought from positivist approaches to a more constructivist approach has caused a reported increase in the use of qualitative methods in organizational and vocational psychology researcher in the past twenty years. Quantitative methods decreased from 40 – 50 percent in 1983-1988 and again decreased 10 percent in 1996-1999. Additionally, qualitative methods have increased from 15-18 percent to 30-40 percent (Imel, Kerka, & Wonacott, 2002). In a study conducted by Elmore and Woehlke in 1998, an increase in the use of qualitative methods in the past ten years was found (Hutchinson & Lovell, 2004). With this shift in research methods, an explanation of the differences and factors that determine the most practical and desirable method needs to be explored. There might not be best method overall to use, but, instead, a particular study might produce valid, more useable results for the betterment of the social science or educational field.

In a study of the five leading journals of higher education research published between the years 1986 and 1989, John Milam found that a vast amount of quantitative methods were used in research as opposed to qualitative methods (Hutchinson & Lovell, 2004). The publication of *The Discover of Grounded Theory* re-legitimized alternative methods and research designs that emphasized the creation of theory out of data and paved the way in social sciences for qualitative research (Easterby-Smith, Golden- Biddle & Locke, 2008). In the past, Bensimon (2004) reports that it was believed that the purpose of research was to produce scientific knowledge that could be used to improve education and student success, but the emergence of qualitative studies has altered that preconceived belief and opened the doors to further social research and even a blend of the two methods, which will be discussed later in the paper.

 There are still those researchers that criticize qualitative research methods even as they have gained attention and recognition. External criticism of education research is that it does not serve evidence-based practice well (Hammersley, 2007). A comparative assessment of qualitative research results still does not exist, and without a standard of measurement, how is the quality of the research determined? Guidelines for qualitative research would compel its critics to recognize the validity of the results and findings, but barriers exist even among qualitative researchers themselves because of the many different approaches and types of qualitative research methods that currently exist.

**The Value of Qualitative Research**

 Though qualitative research has been on the rise in scholarly publications, quantitative methodology has still dominated the past few decades (Keller, 1998). Many researchers seem to be holding on to the notion that quantitative data are more reliable than qualitative data and that hard statistical analysis will somehow solve higher education’s mysteries. As mentioned previously, there exists a belief that the quality of qualitative research is difficult to measure, which is part of the reason this methodology has not been well represented in scholarly journals.

 In an effort to defend qualitative methods, many researchers have concerned themselves with addressing the issue of quality. Amis and Silk (2008) reviewed three forms of quality criteria for qualitative research. The first, foundationalism, attempts to assess qualitative research quality from a quantitative or positivist perspective. By following traditional positivist guidelines of validity, reliability, and generalizability, qualitative researchers can be assured they are abiding by established standards of quality. Quasi-foundationalism acknowledges the lack of objectivity in human research and values the appropriate application of methods to best consider the variety of experience which exists in social settings. Quality is assessed by peer review or set guidelines which understand the problems with the foundationalism perspective while at the same time acknowledging the need for standard, rigorous production criteria. Nonfoundationalism asserts that the observational research in qualitative methods cannot be judged against an external standard, but quality must instead be assessed internally. The authors call for a “democratization of quality” (2008, p. 476): an acknowledgement that there exist different interpretations of quality and that qualitative research can and should be assessed internally with respect to the context of and approach to the research.

Onwuegbuzie and Leech (2007) discuss at length a model for assessing quality in qualitative research. They understand that there has long been an issue of contention among researchers in the judgment of quality. However, they stress that even without an absolute standard by which qualitative research can be judged, qualitative research can still be conducted either well or poorly and that frameworks for assessing quality can be constructed. This framework should primarily focus on legitimacy issues because “utilizing and documenting legitimation techniques should prevent *validity* and *qualitative research* from being seen as an oxymoron” (p. 247).

While there is agreement that qualitative research can be measured, the specific measurement criteria are debated by researchers. Pratt (2008), an organizational theory researcher, raises two primary questions: (a) should qualitative and quantitative research be evaluated by similar or different criteria, and (b) is it even possible or appropriate to create a standard measure of evaluation for all the different types of qualitative research? The lack of consensus regarding these questions leads to difficulty in publication: “if we are not clear about what is good qualitative research, then how can we convince a reviewer or editor that it is worthy to publish?” (p. 482).

Pratt (2008) performed a study in which he surveyed qualitative researchers who had published in top-tier organizational journals. He found that these researchers felt their work was being evaluated unfairly. The reviewers of these journals were perceived as unqualified to assess qualitative research and that they judged qualitative research by quantitative standards. The standards for proving the validity of the results was, therefore, too high, and many researchers found themselves having to write increasingly longer works, include more data, and provide more quantitative content than should be required for a qualitative work.

 There are certain standards by which qualitative and quantitative research can both be evaluated, such as contribution to theory, excellent writing, and a clearly defined, appropriate methodology (Pratt, 2008). However, while the goals of qualitative research may be agreed upon, the means of assessing methodology and quality are not, and there still exists the problem of publication barriers. Pratt (2008) suggests making qualitative submissions more palatable to reviewers by either mimicking the style of a quantitative submission or including quantitative content. Another suggestion he provides is to make journal publishing more qualitative-friendly by training reviewers in qualitative methods.

 It was mentioned earlier that non-researchers reading journal articles may have difficulty comprehending the methodology found in research, regardless of what the methodology is. However, quantitative methodologies, in particular, may be difficult for practitioners to understand as they are not trained in advanced statistics. As Hutchison and Lovell explain, “professionals require at least intermediate-level statistics to adequately comprehend most of the published research” (2004, p. 396), and current trends show that a necessity for even more advanced statistical knowledge is becoming more common. Kezar (2000) found that practitioners value journal articles which have accessible language and are easy to read, which qualitative research and its emphasis on words over numbers may be able to satisfy. With qualitative research perhaps more reader-friendly, researchers working to establish criteria for assessing its quality, and qualitative articles becoming more prevalent in journals, it appears that qualitative research is becoming more valuable in the social sciences.

**Mixed Methods Research**

 The merits of both qualitative and quantitative methodologies have been discussed and qualitative research specifically has been discussed in regard to its measurement of quality. The two methodologies have been presented so far in this paper as they are found in the scholarly world of the social sciences: completely separate from each other. The quantitative versus qualitative debate is centered on the notion that these two methods in research must be polarized. The debate has continued for so long, with researchers fiercely defending each side, that this polarization has become normal. However, there exist researchers who wish to break up this polarization and bring the two sides together.

Ercikan and Roth (2006) argue that polarization between the two methodologies is unreasonable considering both qualitative and quantitative phenomena can be found everywhere in research and nature. The authors provide some commonplace examples which show both the quantitative and qualitative nature of certain phenomena. One example is the notion of commodity found in political economy. Both the qualitative value of the commodity must be defined, for example, as grain, cloth, etc., as well as the quantitative value of price measurement or the exchange value of the commodity.

 Ercikan and Roth (2006) continue by arguing that another striking polarization found with the debate is the issue of objectivity; quantitative research is associated with objectivity and qualitative research with subjectivity, as discussed earlier. However, the authors assert this is not actually the case. In quantitative research, for example, statistical values and data construction require a certain amount of interpretation and judgment. All education research is based upon similar processes for interpretation which for the most part includes some form of subjective judgment. Smeyers (2008) comments that researchers, bound by their human nature, cannot escape their own pre-understandings in their attempt to be objective and value-free. Rather, “whenever we conceptualize a particular part of reality, this necessarily occurs within the boundaries of what already makes sense for us” (p. 701).

 Ercikan and Roth (2006) conclude that the quantitative-qualitative dichotomy is problematic in its assumptions and leads researchers to emphasize data collection and methodology when the focus should be on conducting good and appropriate research. Rather than isolating research in a quantitative or qualitative approach, the authors call for researchers to explore integrative methods and “make choices regarding data sources, data construction, and analysis methods that best fit their research questions and to consider using multiple approaches and modes of inquiry” (p. 23).

True purists oppose any integration of qualitative and quantitative methods, arguing that the two paradigms are incompatible (Johnson & Onwuegbuzie, 2004). Mixing methods would, therefore, be an unacceptable and useless endeavor. However, Johnson and Onwuegbuzie (2004) contend that mixed methods research is a valid paradigm with a goal “not to replace either of these approaches but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies” (p. 15). Modern scholarship values interdisciplinary and dynamic research which requires an understanding and effective use of a variety of methods. The authors argue that methodological pluralism must be encouraged in order to conduct effective and worthwhile educational research. Rather than limiting themselves to a single methodology, researchers can sample from a variety of methods to find a suitable combination which will best serve the study at hand.

 Johnson and Onwuegbuzie (2004) make a distinction between two broad types of mixed methods research: mixed-model and mixed-method. A mixed-model design might first be considered when contemplating mixed methods research; it involves the actual mixing of quantitative and qualitative methods during the research process. A mixed-method design, on the other hand, implements separate qualitative and quantitative phases in a research study. Ultimately, the two are integrated, such as in the interpretation of the findings, but they occur separately in the research process. The authors provide guides to many mixed methods models to illustrate the variety of ways in which this type of research can be conducted depending upon the needs of the research.

 Again, it is important to note that decisions of methodology should be made on a case-by-case basis. Onwuegbuzie and Leech (2003) state purists ignore all the similarities between qualitative and quantitative methodologies and instead focus on the differences between them. However, both qualitative and quantitative researchers discover meaning in the interpretation of data, whether that data is in the form of words or numbers. Researchers on both sides must select the most suitable analytical techniques and verify their data. Johnson and Onwuegbuzie (2004) indicate that “quantitative, qualitative and mixed researches are all superior under different circumstances” (pp. 22-23). Those researchers who are open to a mixed methods approach are more likely to select a method which will best suit their research instead of making decisions based upon preconceived biases regarding the quantitative-qualitative dichotomy.

**Conclusion**

 Sechrest and Sidani (1995) observe that the qualitative-quantitative tension felt so heavily in the social sciences is not found in the natural sciences; methodological pluralism is normal and accepted. Kezar (2000) found in her study that both higher education practitioners and researchers feel that methodology is overemphasized in research. The controversy and disagreements among researchers in the field over the best method can only hinder the advancement of social science and institution and field evaluation and research (Sechrest & Sidani, 1995). It is time for research in higher education to let go of the endless debating and false dichotomy of qualitative and quantitative research. As argued earlier, the two methods can complement each other in order to provide the most accurate, yet individualistic and useful, results for education and policy and program leaders. Qualitative research can provide a rich description and understanding of issues in the field while quantitative research can provide generalizable and accurate data collection, analysis and utilization of that information. As Kezar (2000) reports, if quantitative methods produce results that are disconnected from practice and policy, they can lay the groundwork for further exploratory quantitative methods that need to be studied in order to be more relevant to the issues and problems that educators need to solve every day for the betterment of the field and institutions. The consideration of the meanings or relationships attached to data collected by quantitative means can help foster a better understanding of social issues, higher education requirements, or exploratory needs best studies determined by the use of qualitative methods. Both techniques can be explored and utilized to incorporate the strengths and advantages of each and negate any disadvantages one methodology might have over another (Onwuegbuzie & Leech, 2003).

References

Amis, J., & Silk, M. L. (2008). The philosophy and politics of quality in qualitative

organizational research. *Organization Research Methods, 11*(3), 456-480.

Bensimon, E. M., Polkinghorne, D. E., Bauman, G. L., & Vallejo, E. (2004). Doing

research that makes a difference. *The Journal of Higher Education, 75*(1), 104-

126.

Creswell, J. W., & Miller, G. A. (1997, Fall). Research methodologies and the doctoral

process. *New Directions for Higher Education, 99*, 33-46.

Easterby-Smith, M., Golden-Biddle, K., & Locke, K. (2008). Working with pluralism:

Determining quality in qualitative research. *Organizational Research Methods*,

*11*, 419-429. doi: 10.1177/1094428108315853

Ercikan, K., & Roth, W. (2006). What good is polarizing research into qualitative and

quantitative? *Educational Researcher, 35*(5), 14-23.

Hammersley, M. (2007). The issue of quality in qualitative research. *International*

*Journal of Research & Method in Education, 30*(3), 287-305.

Hutchinson, S. R., & Lovell, C. D. (2004). A review of methodological characteristics of

research published in key journals in higher education: Implications for graduate

research training. *Research in Higher Education, 45*(4), 383-403.

Imel, S., Kerka, S., & Wonacott, M. E. (2002). *Qualitative research in adult, career, and*

*career-technical education*. Retrieved from ERIC database. (ED472366)

Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research

paradigm whose time has come. *Educational Researcher, 33*(7), 14-26.

Keller, G. (1998). Does higher education research need revisions? *The Review of Higher*

*Education*, *21*(3), 267-278.

Kezar, A. (2000). Higher education research at the millennium: Still trees without fruit?

*The Review of Higher Education, 23*(4), 443-468.

Lunenburg, F. C., & Irby, B. J. (2008). *Writing a successful thesis or dissertation*: *Tips*

*and strategies for students in the social and behavioral sciences.* Thousand Oaks,

CA: Corwin Press.

Onwuegbuzie, A. J., & Leech, N. L. (2003). *On becoming a pragmatic researcher: The*

*importance of combining quantitative and qualitative research methodologies*.

Retrieved from ERIC database. (ED482462)

Onwuegbuzie, A. J., & Leech, N. L. (2007). Validity and qualitative research: An

oxymoron? *Quality & Quantity, 41*, 233-249.

Pratt, M. G. (2008). Fitting oval pegs into round holes: Tensions in evaluating and

publishing qualitative research in top North American journals. *Organizational*

*Research Methods, 11*(3), 481-509.

Sechrest, L., & Sidani, S. (1995). Quantitative and qualitative methods: Is there an

alternative? *Evaluation and Program Planning, 18*(1), 77-87.

Smeyers, P. (2008). Qualitative and quantitative research methods: Old wine in new

bottles? On understanding and interpreting educational phenomena. *Paedagogica*

*Historica, 44*(6), 691-705.

Smith, J. K. (1983). Quantitative versus qualitative research: An attempt to clarify the

issue. *Educational Researcher, 12*(3), 6-13.