

## Uses and Limitations of Quantitative Research in English Language Education

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### Abstract

This paper is an attempt to provide insights on quantitative research in general and the uses and limitations of quantitative research in the field of English language education in particular. The paper aims to present and discuss the uses and limitations of quantitative research in the area of English language education. Building upon the literature related to the topic, the paper begins with the background of research in general. Then, it introduces the quantitative research as an important research approach in social sciences. More importantly, it presents and discusses the major areas of uses and limitations of quantitative research in the field of English education. Finally, the paper is concluded with the idea that quantitative research approach is significantly used to address the issues of English language education along with other research approaches in terms of nature and contexts of the research phenomena.

*Keywords:* Quantitative research, uses of quantitative research, limitations of quantitative research

### Introduction

Research is a systematic process of discovering new knowledge on a specific topic. It is also defined as an art of scientific investigation (Kothari, 2004) with a view to generating socially useful knowledge (Brew, 1999). Specific to education, Anderson and Arsenault (1998, p. 6) delineate educational research as “a disciplined attempt to address questions or solve problems through the collection and analysis of primary data for the purpose of description, explanation, and generalization of prediction”. Moreover, Creswell (2012) mentions that educational research consists of three steps in which one engages to pose a question, collect data to answer the question and present an answer to a question. He adds that research is important as it adds new knowledge to the existing body of knowledge; it suggests improvement for practices; and it provides information to the policy makers when they encounter debate on formulating educational policy (Creswell, 2012). Thus, the purpose of educational research is to explore new knowledge about teaching, learning, administration, and other educational phenomena. It involves an organized and scientific process of defining and redefining problems, formulating hypothesis, collecting, organizing and evaluating data, making deductions and reaching the conclusions. The above-mentioned ideas imply that research is a disciplined inquiry that aims at generating evidence-based knowledge on a specific topic or issue which is useful for academic and social purposes.

Research methods in education (and the other social sciences) are often divided into two main types: quantitative and qualitative, however there is the mixed approach in practice to bridge the two approaches. The two approaches are distinct in nature where the quantitative approach is pre-structured, controlled and deductive in nature whereas qualitative approach is flexible, emergent and process oriented. Thus, the researcher needs to be clear about which research approach he/she is going to adopt throughout the research. The researcher's approach to any research question is influenced by his or her personal history, beliefs, existence and personality (Somekh & Lewin, 2011; Freimuth, 2009). Since there are different approaches to research used in the field of social sciences in general and in the field of education in particular, here, the main purpose of this paper is to define quantitative research and discuss its uses and limitations in specific to the field of English language education. Thus, the subsequent sections will be about a brief discussion on the introduction and nature of quantitative research and enumeration of uses and limitations of quantitative research in the field.

### **Quantitative Research: A Basic Concept**

Quantitative research is defined as a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical, or computational techniques to derive the results. Creswell and Creswell (2019, p. 41) define quantitative research as “an approach for testing objective theories by examining the relationship among variables. These variables, in turn, can be measured, typically on instruments, so that numbered data can be analyzed using statistical procedures”. Likewise, Apuke (2017) states that the quantitative research method deals with quantifying and analyzing the variables to derive results. In the same way, Aliaga and Gunderson (2002) describe that quantitative research is ‘explaining phenomena by collecting numerical form and analyzing with the aid of mathematically based methods in particular statistics’.

Thus, in quantitative research, the researcher tries to explain the phenomena to answer the questions like what or how many to collect numerically quantifiable data and the collected data are analyzed using mathematically based methods and procedures. Similarly, Bryman (2012, p. 35) defined quantitative research as, “a research strategy that emphasizes quantification in the collection and analysis of data...” It means quantitative research denotes amounting something. This research method attempts to investigate the answers to the questions starting with ‘how many’, ‘how much’, to ‘what extent’, etc, (Rasinger, 2013). In other words, the method lays a heavy stress on measuring variables existing in the social world. In the same way, Payne and Payne (2004, p. 180) state that quantitative methods (normally using deductive logic) seek regularities in human lives, by separating the social world into empirical components called variables which can be represented numerically as frequencies or rate, whose associations with each other can be explored by statistical techniques. So, the quantitative research focuses on those aspects of social behavior which can be quantified and patterned rather than just finding out them and interpreting their meanings people bring to their own action. The researcher, in quantitative research, intervenes the research context with a view to detecting cause and effect relationships between the variables being investigated (Burns, 1999). Therefore, there is objectivity in quantitative research in which the results from the sample population are generalizable to the entire population. It is a deductive process of

research that tests the existing theory in order to justify and falsify it by following the scientific procedures.

### **Methods and Materials**

Since this paper is theoretical in nature, we employed document analysis method to prepare this paper. Document analysis is a systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material (Bowen 2009). He further writes that document analysis involves skimming (superficial examination), reading (thorough examination), and interpretation. This iterative process combines elements of content analysis and thematic analysis. Corbin and Strauss (2008) mention that document analysis is an analytical method employed in qualitative research in which the secondary data are examined and interpreted to derive meaning, gain understanding, and develop empirical knowledge. Drawing on the document analysis method, we examined related secondary sources of data, i.e., books, journal articles, reports and dissertation, analyzed and synthesized them and made arguments in different themes.

### **Results and Discussion**

#### **Uses of Quantitative Research in the Area of English Education**

As stated above, quantitative research is objective and scientific; it can be used in several disciplines and fields of social sciences. Among the various disciplines, education is one of the very important fields in which the process and approach to quantitative research is significantly employed. The field of education also has several sub-fields such as English education, mathematics education, science education, to name few. Here, the main concern of this paper is to present and discuss the uses and implications of quantitative research in the field of English education. While making discussion on the uses of quantitative research in specific to the field of English education, the potential areas are identified first and presented and discussed in the thematic titles in the subsequent lines.

**Experiment of the Effectiveness of Teaching Methods and Approaches.** Teaching and learning are the core elements of the educational process. The effectiveness of the whole educational process lies on the effectiveness of teaching and learning activities performed in the class. In order to make teaching and learning activities effective, there should be effective use of teaching method and approaches in the classroom. In this regard, experimental research can be very useful to determine whether the methods and techniques are effectively practiced or not. The process of teaching and learning can be improved with the help of results derived from the experimental research conducted in schools and colleges by the teachers. To put in another way, the relationship between the dependent variable (learning achievement of the students) and the dependent variables (use of new methods, techniques and materials) can be examined and calculated using bivariate and multivariate statistical tools and techniques.

**English Language Testing System.** The concept and process of quantitative research are very effective and contributory to the process designing different types of English language tests. The notions of validity and reliability are important criteria for designing and administering language tests at different levels in which the knowledge of quantitative research

helps significantly. In the same way, the knowledge of quantitative research is very much important in scoring and analyzing tests results of the students. In this regard, different types of statistical tools and measures are needed which can be drawn from quantitative research insights.

**Linguistic Surveys.** This is a broad area of English language education in which approaches to quantitative research can be used. As survey is a major type of quantitative research design, it is very useful to carry out linguistic survey of any country, region and district. In the linguistic survey, the researcher needs to determine the sample population, develop survey questionnaire, checklist and other tools and techniques. In these concerns, the researchers like linguists and teachers need a sound knowledge of quantitative research. After the collection of data using the tools, it is equally necessary to have the insights of quantitative data analysis procedures for the researcher.

**Contrastive Analysis.** The knowledge of quantitative research is also useful to make a comparative study of two or more languages. Statistical measures (percentage, correlation coefficient, standard deviation) are also useful to make a comparative study of two or more languages in terms of their different elements like the sound system, grammar system, vocabulary items and the like.

**Machine Translation.** It is relatively recently developed field of language and linguistics. It is also called computational linguistics. Many of the notions are borrowed from mathematics into this field. In the course of computation of linguistic codes and data to be read by the computer, the insights and concepts of quantitative research is very significantly employed.

**English Language Teaching (ELT) Survey.** English language teaching has its own history of about one and half century. A number of methods and techniques has been devised, developed and practiced in different period of time. To make a chronological and historical study of ELT, we can conduct a survey of ELT method and techniques. In this regard too, we can effectively use the quantitative research approach.

**Para-orthographic Texts.** Linguistic information and data are presented in para-orthographic texts such as charts, graphs, figures and so on. For this too, we need quantitative research procedures and tools.

**Communication Engineering.** Communication is the major goal of learning and using language. Communication engineering is a very scientific field of linguistics. In the course of sending and receiving information in communication, we need to have some concepts and procedures of quantitative research.

### **Limitations of Quantitative Research in English Language Education**

Since quantitative research is structured, scientific and reliable in its process and results, it has also been questioned in many respects. It is problematic to quantify all sorts of data and a statistical analysis cannot be appropriate in all situations. Similarly, the results derived from the sample population are not generalizable to all larger groups. To be specific, since the scope and uses of quantitative research in education in general and in the field of English language

education in particular is significant, it has some limitations. It means that there are some areas in which the quantitative research seems to be insignificant and not much relevant. Thus, the areas and issues of English education that are not well addressed and explored by the use of quantitative research approach are presented and discussed in the subsequent section.

**Belief System on Language and Linguistics.** People may have varied belief and understanding on different languages and linguistics. The belief of the people can be explored through an unstructured in-depth interview and participant observation in a continuous series. Such in-depth data on the belief and understanding about language and linguistic activities can be better delineated and explicated in the textual form rather than quantitative presentation.

**Analysis of Peoples' Feelings and Experiences about Language and Culture.** People are unique and distinct in their feelings and experiences about certain phenomenon. Their feelings and experiences vary in accordance with the contexts. So, the experiences and feelings of one group of people cannot be generalizable to another group of people. On this background, we see limitations of quantitative research. It varies from one cultural group to another which cannot be quantified either.

**Language Identity and Language Ideology.** The phenomena of language identity and language ideology are socially and culturally constructed which are subjective notions too. Such issues are difficult to quantify for a statistical analysis. Moreover, data from the respondents about these phenomena are often analyzed and interpreted in qualitative way in comparison to quantitative analysis.

**Cases of Linguistic Imperialism and Hegemony.** The issue of linguistic imperialism and hegemony are directly linked with peoples' abstract ideas and feelings which cannot be directly quantified in statistical manners. The data about these issues and phenomena can be well explored and analyzed through qualitative research designs, like ethnography and phenomenology in comparison to survey and experimental.

**Analysis of Language Policy and its Practices.** Textual and policy document analysis on language education can be analyzed and interpreted through language and text rather than number and statistics. In such documents abstract and subjective notions and ideas are presented and explained which are not much sensible in quantitative analysis.

**Context Insensitive.** The phenomena to be researched under English language education are context sensitive. Therefore, they are to be explored and discussed in relation to context. However, quantitative research process is structured and objective as it provides the outsider perspective of the phenomena being explored with less emphasis on the context of the study.

## **Conclusion**

This paper introduces quantitative research as an important approach to describe the research phenomena statistically which exerts vital space in the research dynamics of social sciences including education. It is structured and objective process of research. The findings derived from the quantitative research are objective and generalizable to a larger group of population from which we can manage time and cost. Moreover, quantitative research has

significant scope in the field of social sciences from which larger size survey studies can be conducted. Similarly, this research approach has important contribution in the field of education in general and English language education in particular. More importantly, among various types of quantitative research, experimental and survey research designs seem to be more appropriate to bring changes in the classroom teaching and learning. Nonetheless, there are some specific domains of English language education like people's belief systems on language identity and ideology for which quantitative research process is likely to be inadequate to explain the phenomena in relation to their context. Therefore, to address such issues qualitative and mixed methods designs are also suggested to adopt in addition to quantitative research approach.

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