

QUANTITATIVE CONTENT ANALYSIS OF VIRGINIA DOCTORAL DISSERTATIONS

2007-2017: TRENDS IN DEGREE TYPES AND METHODOLOGIES

Craig H. Krueger

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University, Lynchburg, VA

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ABSTRACT

This study was a trend analysis of the choices made by doctoral candidates in the state of Virginia who sought degrees in the field of education. It analyzed frequencies of degree types (EdD degree compared to the PhD) and research methodologies (quantitative, qualitative, and mixed methods). This research is important because no such study has been done since 1994. The information will be useful to both those who lead doctoral programs and to people who seek to understand philosophical implications and practical applications of these degree and methodology types. The purpose of the study is to bring up to date existing studies of doctoral dissertations. Using the theoretical framework of requisite decision modeling, this quantitative study of archived data determined that there are statistically significant trends in doctoral candidates' choices of degree and research methodology in the state of Virginia in the time span of the study. One hundred thirty dissertations published in the state of Virginia were randomly selected from the ProQuest Dissertations and Theses Global database for each of the years 2007, 2012, and 2017. This research employed content analysis and trend analysis methods.

Keywords: dissertation, Doctor of Education, EdD, Doctor of Philosophy, PhD, quantitative research, qualitative research, mixed methods research

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Dedication

To the Lord Jesus Christ, with thanksgiving for His mercy and grace, love and truth.

“For of him, and through him, and to him, *are* all things: to whom *be* glory forever. Amen.”

(Romans 11:36, KJV).

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Dr. Kurt Michael rescued my doctoral work in a very practical way. When the college where I worked closed and I lost the data source for a dissertation after the prospectus phase, it was he who proposed this topic. I seized it at first, to paraphrase from Dr. Ellen Black, because I was committed to graduating. As I saw how research methodology relates to Christian apologetics and the battle for the soul of America, I became passionate about what I was learning. (Dr. Michael, I never believed that you taught any widgets.)

Dr. Damian Ahrens has been a model of the principles of the Word of God in action as a man, a husband, a father, a pastor, a school leader, and a friend. His indefatigable enthusiasm for Christian education and his trust in God have inspired many people. In the good times, he has glorified God; in the hard times, he has trusted in Him. I am thankful for his willingness to be a member of this doctoral advising committee.

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Table of Contents

ABSTRACT	3
Dedication	5
Acknowledgments	6
List of Tables	11
List of Figures	12
List of Abbreviations	13
CHAPTER ONE: INTRODUCTION.....	14
Overview.....	14
Background.....	14
Problem Statement	18
Purpose Statement.....	18
Significance of the Study	20
Research Questions.....	21
Definitions.....	22
CHAPTER TWO: LITERATURE REVIEW.....	25
Overview.....	25
Theoretical Framework.....	25
Phillips and the Origin of Requisite Decision Modeling	25
Clemen and the Advance of Requisite Decision Modeling	28
Related Literature.....	30
Research Methodology	30
Doctoral Degrees and Dissertations.....	35

Dissertation Research Methodologies.....	45
Summary.....	64
CHAPTER THREE: METHODS.....	66
Overview.....	66
Design.....	66
Research Questions.....	68
Null Hypotheses.....	68
Participants and Setting.....	68
Procedures.....	71
Data Analysis.....	76
Data Screening.....	76
Variables.....	76
Assumption Testing.....	77
Analysis and Reporting.....	78
Summary.....	80
CHAPTER FOUR: FINDINGS.....	82
Overview.....	82
Research Questions.....	82
Null Hypotheses.....	82
Descriptive Statistics.....	83
Results.....	84
Data Screening.....	84
Assumptions.....	85

	10
Results for Null Hypothesis One	85
Results for Null Hypothesis Two.....	88
Summary.....	92
CHAPTER FIVE: CONCLUSIONS	94
Overview.....	94
Discussion.....	94
Year of Publication and Degree Choice.....	95
Year of Publication and Methodology Choice.....	97
Limitations	99
Implications.....	100
Empirical Implications.....	100
Theoretical Implications	100
Practical Implications.....	102
Recommendations for Future Research	103
Summary.....	104
REFERENCES	105
APPENDICES	114

List of Tables

Table 1: Nelson and Coorough's Percentages of EdD Degrees Compared to PhD Degrees	43
Table 2: Kantorski and Stegman's Percentages of EdD, PhD, and DME Degrees	44
Table 3: Alasuutari's Percentages of Quantitative Articles in British Journals.....	63
Table 4: Kantorski and Stegman's Percentages of Qualitative Dissertations in Music.....	63
Table 5: Frequencies of Degree Types in All Years of the Study	71
Table 6: Frequencies of Methodology Types in All Years of the Study	71
Table 7: Frequencies of Degree Types in All Years of the Study, Ordered for SPSS.....	83
Table 8: Frequencies of Methodology Types in All Years of the Study, Ordered for SPSS.....	84
Table 9: Crosstabulation for Degree Types in All Years of the Study	86
Table 10: Chi-square Tests for Degree Types in All Years of the Study	87
Table 11: Symmetric Measures for Degree Types in All Years of the Study	88
Table 12: Crosstabulation for Methodology Choices in All Years of the Study	89
Table 13: Chi-square Tests for Methodology Choices in All Years of the Study	90
Table 14: Symmetric Measures for Methodology Choices in All Years of the Study	90
Table 15: Chi-square Tests for Pairwise Comparison of Methodology Types, 2007 and 2012....	91
Table 16: Symmetric Measures for Pairwise Comparison of Methodology Types, 2007 and 2012	91
Table 17: Chi-square Tests for Pairwise Comparison of Methodology Types, 2012 and 2017....	92
Table 18: Symmetric Measures for Pairwise Comparison of Methodology Types, 2012 and 2017	92
Table 19: SPSS Variable Codes.....	115

List of Figures

Figure 1: Doctoral Degrees Granted in the Virginia Sample Population by Year and Degree Type	96
Figure 2: Doctoral Degrees Granted in the Virginia Sample Population by Year and Degree-granting Institution	97
Figure 3: Dissertation Methodology in Virginia Sample Population by Year, All Institutions ...	98

List of Abbreviations

Carnegie Project on the Education Doctorate (CPED)

Doctor of Education (EdD)

Doctor of Philosophy (PhD)

Institutional Review Board (IRB)

Investigator Triangulation (IT)

Mixed-Methods Research (MMR)

Return on Investment (ROI)

Straight-Edge (sXe)

CHAPTER ONE: INTRODUCTION

Overview

This chapter explores the context for an inquiry about trends in doctoral dissertations in the state of Virginia from 2007 to 2017. It considers the frequency of the Doctor of Education Degree (EdD) compared to the Doctor of Philosophy Degree (PhD) and the frequency of study methodologies, including quantitative, qualitative, and mixed-methods studies. The chapter includes the historical, social, and theoretical backgrounds of the study. The problem statement, the purpose and significance of the study, and research questions are introduced. Finally, a list of definitions of key terms is presented.

Background

The doctoral dissertation, a long-standing fixture in higher education, is in flux. Considering doctoral dissertations in the field of education in particular, the percentages of doctoral dissertations written in EdD programs, compared to those written in PhD programs, has fluctuated through the years (Nelson & Coorough, 1994; Walker & Haley-Mize, 2012). Similarly, the major categories of research methodology—quantitative, qualitative, and mixed methods—have also shifted in frequency of use (Walker & Haley-Mize, 2012). These choices matter because they affect issues of power and prestige (Devos & Somerville, 2012; Stock & Siegfried, 2017; Walsham, 2015), direction of public policy (Hochbein & Perry, 2013), and comprehension of the nature of truth and reality (Alasuutari, 2010; Sale, Lohfeld, & Brazil, 2002; Schaeffer, 1972). Although past research documented changes in degree choices and methodologies, there is little research focusing on the most recent ten years, and none that deals specifically with the colleges of the state of Virginia.

The historical background of the EdD and PhD divide dates back only to the 1920s, when the first Doctor of Education Degree was conferred at Harvard University (Walker & Haley-Mize, 2012). Nelson and Coorough (1994) documented shifts in the numbers of doctoral candidates following the EdD route compared to the PhD, noting the fluctuating percentages from 1950 through 1990. Not only did the relative frequency of degree types lack a pattern, but the distinctions between the two degrees have not been uniformly acknowledged. The nature of the two degrees, their content, and their purposes have been argued over the years (Boyce, 2002; Nelson & Coorough, 1994; Perry, 2015).

The theoretical frameworks of quantitative research and qualitative research are strikingly different. Quantitative research is commonly associated with the theory of positivism and its emphasis on unbiased observation of objective reality, reported as statistics (Creswell, 2013; Sale et al., 2002). Qualitative research is linked with the theory of constructivism and relies upon researchers' and participants' subjective understandings of situations reported in verbal descriptions (Creswell, 2013). Despite these contrasts, there is a growing trend toward using both quantitative research, with its positivist paradigm, and qualitative research, with its constructivist system, together as mixed methods research (Archibald, 2016; Creswell, 2015).

Although quantitative research has clear history dating back to the seventeenth-century birth of modern science (Whitehead, 1953, 1967) and the eighteenth-century Enlightenment (Alasuutari, 2010), qualitative research is a relatively new phenomenon in the sense that a variety of existing techniques were collected under the title *qualitative* (Alasuutari, 2010). After identifying the origin of qualitative research, in this sense, as the 1960s, Alasuutari (2010) cited several studies which dated the rise of qualitative research studies over quantitative in various countries, starting with Britain in the 1960s and concluding with the United States of America as

the last, experiencing this transition in the 1980s. Three methods (quantitative, qualitative, and mixed methods) have been used in differing ratios over the years. Unlike the PhD/EdD divide, however, there is a clear pattern, with qualitative research on the rise (Alasuutari, 2010; Sale et al., 2002). Like the distinctions between EdD programs and PhD programs, the qualitative versus quantitative distinction is less clear than initial observations might suggest. In its simplest form, the quantitative dissertation focuses on external, objective phenomena and gathers numerical data; and the qualitative dissertation focuses on internal understandings and gathers descriptive verbal data (Creswell, 2007). However, Sale et al. (2002) discussed at length the blurring of those boundaries with the rise of mixed-methods research, combining elements of the quantitative and qualitative research processes.

The social contexts of these types of degrees and the contrasting methodologies are apparent in the literature. The EdD and PhD are often seen as serving two different functions. Since the introduction of the EdD, the theoretical distinction between that and the PhD has been clear (Perry, 2015; Wilson, Cooper, Johnson, & Wright, 2014). The PhD degree is often viewed as preparation of the researcher-theorist, the one more concerned with adding to the existing knowledge base, exploring new theoretical territory, or critiquing existing theory (Park, 2005). The EdD degree is commonly seen as preparation of the researcher-practitioner, the one more concerned with applying existing theory to solve practical, local problems (Amrein-Beardsley et al., 2012). However, some authors have debated that those two degrees are not always distinct in practice (Amrein-Beardsley et al., 2012; Perry, 2015; Walker & Haley-Mize, 2012). New programs making the EdD distinct from the PhD and promising innovation with practical applications are still originating (Amrein-Beardsley et al., 2012; Perry, 2015; Wilson et al., 2013).

Different theoretical bases underlie the different methodologies. Quantitative research methods are usually seen as rooted in positivism (Sale et al., 2002). Creswell (2009) even suggests “positivist research” as an alternative title for quantitative research (p. 650). A positivist worldview assumes “objective reality that exists independent of human perception” (Sale et al., 2002, p. 44). Positivism seeks to reduce all its inquiries to a system of cause-and-effect reactions and to analyze systems in such a way as to eliminate any bias of the researcher (Walsham, 2015). Qualitative research methods not only are distinct from quantitative, but they arose, in part, as a reaction against the assumptions of positivism (Alasuutari, 2010). Alasuutari (2010) related the rise of qualitative research in the 1960s to a skepticism by some researchers about the validity of expressing complex social situations as a series of empirically observable cause-effect events. Similarly, Walsham (2015) pictured the debate regarding qualitative research, which he termed “interpretive research” (p. 376), as contrasting with quantitative research, which he called “positivist research” (p. 376). Like Alasuutari (2010) and Walsham (2015) stated that the foundational difference is the debate about whether objective knowledge is possible (quantitative research) or whether the humanity of the researcher and the interactions with the people who are the participants, or subjects, of research will always bias the collection of data (qualitative research).

In summary, the EdD and the PhD were envisioned as two distinct degrees, with different requirements and purposes. Quantitative and qualitative research are often presented as contrasting each other at foundational levels. Yet some authors have argued that the two degrees are not so very different and that the research methodologies are not only contrasting, but also complementary.

Problem Statement

No systematic comparison of the numbers of EdD dissertations compared to PhD dissertations in the field of education has been published since the landmark 1994 study by Nelson and Coorough (1994). Walker and Haley-Mize (2012) did a similar study of EdD and PhD dissertations from 1997 to 2010, but that was limited to the field of special education.

Similarly, much has been published in professional journals regarding the nature of quantitative and qualitative methods of research, sometimes including mixed methods (Alasuutari, 2010; Sale et al., 2017; Walsham, 2015; Weber, 2014). However, only Stock and Siegfried (2017) presented a systematic comparison of the frequencies of dissertation types over time. That study covered a sampling of dissertations written every 10th year from 1970 through 2010. However, these dealt with the field of economics only, and they focused on the rise of the essay-type of dissertation in that field, not the quantitative/qualitative/mixed methods comparison. The problem is that there are no studies in recent years which analyze the frequency of the choices doctoral candidates in the field of education have made between the EdD and the PhD degree or their dissertation methodology types.

Purpose Statement

The purpose of this quantitative, archival, content analysis study of dissertations written in the field of education was to provide a current view of trends in doctoral treatises in the state of Virginia on two variables: the type of degree being pursued, EdD or PhD, and the kind of methodology being used, quantitative, qualitative, or mixed methods. The *Doctor of Education Degree*, the *EdD*, is defined as the degree given in a program focused upon educational practice, and the *Doctor of Philosophy Degree*, the *PhD*, is defined as the degree given in a program focused upon theory (Nelson & Coorough, 1994; Walker & Haley-Mize, 2012). In contrast to

these broad distinctions, however, there is much discussion on the lack of clear differentiation between these two degrees (Buss, Zambo, Zambo, Perry, & Williams, 2017; Shulman, Golde, Bueschel, & Garabedian, 2006; Walker & Haley-Mize, 2012). *Quantitative methodology* is defined as a research design that assumes that human interactions are based on objectively observable phenomena and are somewhat stable across the range of social groups or times. It records data which can be expressed in numbers and then analyzes those numbers by statistics (Creswell, 20). *Qualitative methodology* is defined as a research design that is based on the belief that people develop their own, unique ideas of reality, and that these conceptions of reality vary among social groups and across the range of times. It employs extensive observation of individuals or groups, or reviews artifacts, seeking to understand the “lived experiences” (Creswell, 2013, p. 76) of an individual or group. Qualitative research explores the complexity of relationships among people, seeking the integration of many interactions as it “analyzes words, reports detailed views of participants, and conducts the study in a natural setting” (Creswell, 2013, p. 300). It does not seek to provide findings that are generalizable beyond the individual or group being studied (Creswell, 2013). *Mixed-methods methodology* is defined as a research design that employs both quantitative and qualitative techniques in the same study or group of studies focused upon the same question (Creswell, 2013). More than a simple amalgamation, “with emerging procedures, a notation system, and specific designs, the discussion has turned to viewing mixed methods as a separate and distinct design” (Creswell 2015, p. 540).

The dissertations that were analyzed were randomly selected from all dissertations dealing with the field of education published in the state of Virginia and held in the ProQuest Dissertations and Theses Global database for the years 2007, 2012, and 2017.

Significance of the Study

This study offers significant insights into the current state of doctoral programs. Previous studies have laid foundations for this one. For instance, Nelson and Coorough (1994) did a study of all EdD and PhD dissertations written in the last year of each decade from 1950 to 1990, looking especially at methodological trends within each kind of dissertation. Their work focused on seven specific education fields, such as educational administration and physical education. Walker and Haley-Mize (2012) did a study of the research designs and statistical analysis types used in EdD and PhD dissertations from 1997 to 2010, but their study was limited to the field of special education. There is no study tracing the balance of EdD degrees compared to PhD degrees in the field of education that brings this research up to the present.

Study of the qualitative/quantitative/mixed methods divide is similarly outdated. Sale et al. (2002) provided significant insights on methodologies used within the specific field of nursing, but these were about any kind of published study, not just dissertations. Historical reviews of the methodology debates were provided by Alasuutari et al. (2010) and Walsham (2015), but they did not analyze trends, that is, whether certain methods were becoming more or less frequent. Stock and Siegfried (2017) provided a detailed study of the relative numbers of dissertation types from 1970 to 2010, but they dealt only with the area of economics. This study will bring up to the present time the analysis of degree types and methodologies chosen by doctoral students studying the field of education.

This study offers significant insights for those who design and lead doctoral programs in higher education. There is reason for college administrators to consider whether or how they need to refine the curricula that lead to the EdD and PhD degrees. Degree types matter because the PhD degree is sometimes perceived as being more prestigious (Wilson et al., 2014). Yet the

two degrees have sometimes been criticized as being essentially the same in content (Nelson & Coorough, 1994). Currently, the Carnegie Project on the Education Doctorate is working with 24 doctoral-degree-granting institutions to develop a set of distinctives to differentiate the EdD from the PhD (Boyce, 2012; Perry, 2015). Knowing whether or not there is a trend in doctoral candidates' choices between the two major degree types will suggest whether further consideration is needed about (1) whether a doctoral-degree-granting institution's programs warrant the distinction in degrees and (2) whether students are choosing the degree that will best advance their educational goals.

Any possible trends in methodological choices matter not only to those who lead doctoral programs, but also to the general public. The two major methodologies are based on two very different worldviews. Quantitative research is based on positivism (Walsham, 2015) and is intended to provide generalizable results (Boyce, 2012). Qualitative research is based on constructivism (Sale et al., 2002) or interpretivism (Walsham, 2015), and is not intended to provide generalizable results (Boyce, 2012; Creswell, 2013). Trends in methodology may reflect trends in the worldviews of doctoral students. The general public needs to be aware that not all scientific research is useful for establishing generalized statements of fact. This is a serious matter when research studies are presented as reasons for establishing public policy (Perry, 2015).

Research Questions

RQ1: Is there a trend in the frequency of EdD dissertations compared to PhD dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017?

RQ2: Is there a trend in the frequency of research methodology choices (quantitative, qualitative, and mixed methods) for dissertations written in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017?

Definitions

1. *Constructivist methodology* – Constructivist methodology is an alternative term for qualitative methodology (Creswell, 2013).
2. *Dissertation* – A dissertation is a written research study, often guided by a hypothesis, and involving both evidence and logic (Stock & Siegfried, 2017).
3. *Doctor of Education Degree (EdD)* – The Doctor of Education Degree is awarded in a program designed to develop “scholar practitioners” (Boyce 2012, p. 24) who will focus on applying research to effect change in society (Amrein-Beardsley et al., 2012; Boyce 2012).
4. *Doctor of Philosophy Degree (PhD)* – The Doctor of Philosophy Degree is awarded in a program designed to develop scholar-researchers who will focus on developing and assessing theory in various fields of study (Amrein-Beardsley et al., 2012; Boyce, 2012).
5. *Doctoral program* – A doctoral program is all the “formal coursework, the assessments and milestones (such as qualifying exams), seminars, field experiences, publications and presentations students are expected to make” (Golde, 2015, p. 210) in the course of earning a doctoral degree.
6. *Methodological drag* – Methodological drag is an approach in which “qualitative methodologists convincingly masquerade as situated within epistemological, theoretical, and methodological frameworks, even those that they may not situate themselves in personally or professionally” (Nordstrom & Happel-Parkins, 2016, p. 149).

7. *Mixed-methods methodology* – The term *mixed methods* characterizes a research design that employs both quantitative and qualitative techniques in the same study (Creswell, 2013). This combination is manifested in new patterns distinct from both quantitative and qualitative research in their methods, their research designs, and in their ways of coding and processing data (Creswell, 2015) and incorporates multiple perspectives simultaneously to enhance understanding of complex phenomena (Sale, Lohfeld, & Brazil, 2002).
8. *Positivist methodology* – Positivist methodology is an alternative term for quantitative methodology (Creswell, 2013; Weber, 2004).
9. *Qualitative methodology* – Qualitative methodology is a research design that is based on the belief that people develop their own, unique ideas of reality, and that these conceptions of reality vary among social groups and across the range of times. It employs extensive observation of individuals or groups, or reviews artifacts, seeking to understand the “lived experiences” (Creswell, 2013, p. 76) of an individual or group. It does not seek to provide findings that are generalizable beyond the individual or group being studied (Boyce, 2012; Creswell, 2013).
10. *Quantitative methodology* – Quantitative methodology represents research designs that assume that human interactions are based on objectively observable phenomena and that these phenomena are relatively stable across a range of social groups or times. It employs methods such as surveys, field studies, and experimental or quasi-experimental designs, providing data which can be expressed in numbers and analyzed by statistics (Creswell, 2013; Weber, 2004).

11. *Requisite decision model* – “A requisite decision model is defined as a model whose form and content are sufficient to solve a particular problem” (Phillips, 1984).
12. *Trend study* – Trend studies are “longitudinal survey designs that involve identifying a population and analyzing changes within that population over time” (Neuendorf, 2017, p. 382).
13. *Worldview* – “Worldviews are the broad philosophical assumptions that researchers use when they conduct their studies” (Creswell, 2015, p. 539).

CHAPTER TWO: LITERATURE REVIEW

Overview

Chapter two presents the historical background of the different doctoral degrees, from Medieval times to the present, including the development of the most-often chosen degree types in the field of education, the Doctor of Education Degree (EdD) and the Doctor of Philosophy Degree (PhD). It also traces the origin and development of the dissertation process. The theoretical frameworks of two major methodology types, quantitative research and qualitative research, are presented. The literature review explores the current status of these elements—EdD and PhD; quantitative research, qualitative research, and mixed-methods research—and identifies the need for further research in the trends relating to the choices doctoral candidates make among them.

Theoretical Framework

The theoretical framework for this study is requisite decision modeling. The choices individuals make about which form of doctorate to pursue and what types of research methodology to employ are significant choices. Although people may arrive at those decisions in various ways, the process of requisite decision modeling can apply to many people's decisions. Building on the seminal work of Phillips (1984), Clemen and others (Clemen, 2001; Clemen, & Reilly, 2013; Clemen & Ulu, 2008) have brought the theoretical framework of requisite decision modeling into the twenty-first century.

Phillips and the Origin of Requisite Decision Modeling

Phillips (1984) defined a requisite decision model as “a model whose form and content are sufficient to solve a particular problem” (p. 29). In introducing the process of decision modeling, he proposed the case of a manufacturing company that was considering a new product,

something that would move the existing company into an entirely new market of competition. The management team charged with this decision spent two days intensely working through this problem. Several possible products were proposed, and each product was analyzed in regard to a list of various “attributes” (p. 30), each of which could be applied to all products. These attributes were not existing data, but descriptors which were developed as part of the *ad hoc* decision-making process. These attributes were the distinctive qualities that made each product different from the others. Then, for each potential product, each attribute was assigned a positive or negative number. A positive value reflected the degree in which that attribute was a benefit to the company, and a negative reflected the degree in which that attribute was a cost. These values were subjectively assigned numbers. With the help of an “online computer” (p. 30), a scatter plot made the combined positive and negative values to be visual. The two axes of the graph were “benefit” and “cost” (p. 31). The axes of the graph were both labeled from low to high. The ideal product would be located at the point representing the intersection of the high point of benefit and the low point of cost. The surprise in the case study was a product possibility which was suggested, almost discarded, but then kept in the study. It was kept because it would be a reference point, showing where a very unlikely idea would fall on the graph. In the outcome, this product idea was the one closest to that ideal high-benefit, low-cost point. As the team reexamined the balance of already-determined cost-benefit analyses for that product, they began to see more clearly why that one choice was better than the others. This systematic, analytical decision-making helped people to see more clearly what was in front of them all the time.

Another element of Phillips’s requisite decision modeling was the role of intuition and creativity. The new-product case study involved attributes which did not have purely numeric data that could be ascertained by observation and experimentation because these products did not

yet exist. Similarly, the decisions that people make about doctoral degrees or research methodologies involve elements that cannot be measured objectively in numbers. The case study presented by Phillips (1984) was an ongoing, evolving process, influenced by intuitions that arose from careful consideration of the costs and benefits of the options. “Through successive refinements of the model, new intuitions invariably emerge about the problem, and often an implementable solution is reached” (Phillips, 1984, p. 30). The theory of requisite decision modeling does not merely facilitate analysis of the decision. There is an “essentially creative role of models in problem solving” (Phillips, 1984, p. 34), which can lead to new insights and options.

Through sensitivity analysis, requisite decision modeling analyzes not only the product to be manufactured (as in the case study) or other goals of any decision process but also the mindset of the stakeholders. Sensitivity analysis allows the inclusion of people’s varying tolerance for, or motivation by, factors such as risk or short-term gains (Clemen & Reilly, 2013). Phillips (1984) stated, “Sensitivity analysis plays a crucial role in developing requisite models” (p. 36). Phillips (1984) also stated that the process of sensitivity analysis promotes the development of new intuitions, which are then built into the on-going analysis of the attributes of the possible choices.

Phillips (1984) explained both the use of the word *requisite* and his justification for calling it a model. He wrote, “We choose the term ‘requisite’ to distinguish this type of model from descriptive, normative, optimal, satisficing [British] or any other kind of model commonly encountered in the decision literature” (Phillips, 1984, p. 35). The term *requisite* indicates that everything needed to complete the decision process has been included. Stating that the word *model* is derived from a Latin word meaning “small measure” (p. 33), he asserted that requisite decision modeling is a small representation of the greater reality which it is used to explore. The

requisite decision process is a model, Phillips stated, because it (1) omits elements which the decision makers expect to be inconsequential to the results, (2) includes complex interactions of real-world elements of the reality that are “approximated in the model” (p. 35), and (3) acknowledges that some elements of the “social reality [of the real-world application of the decision] may be blurred” (p.35). That last statement means that some elements may be important, but the manner in which they are classified in the decision-making process is not important, such as the difference between the immediate and the long-term value of the product.

The decision-making theory described by Phillips may not have been new, but he analyzed the process into its components and expressed it as had not been expressed before (Clemen, 2001; Clemen & Reilly, 2013). In describing the process in detail, emphasizing the interrelation of analysis, intuition, cost-benefit analysis, sensitivity analysis, and decision making, Phillips both named and garnered wide attention to a theory of decision making, requisite decision modeling.

Clemen and the Advance of Requisite Decision Modeling

Clemen (2001) and others have advanced requisite decision modeling to the present time. Very early, Frisch and Clemen (1991) reiterated Philip’s decision-making theory, summarizing it this way: “Phillips (1984), for example, defined the notion of a requisite decision model, one that contains everything that is essential to solving the problem but ignores nonessential issues” (p. 47). In 2004 Clemen became the founding editor of the journal *Decision Analysis*. In 2013 Clemen and Reilly published *Making Hard Decisions With Decision Tools*, which one review describes as “a must-read for students and practitioners” (Zilinskas, 2018, p. 127) and as a textbook for graduate students and upper-level undergraduates. These references indicate that

Clemen has become a significant voice in the theory of decision making in the twenty-first century.

The most recent publication available from Clemen (Clemen and Reilly, 2013), restated and expanded the work of Phillips. This book reiterated Phillips's ideas, such as the inclusion of all factors which the decision makers consider to be important, the exclusion of those which they do not consider to be important, sensitivity analysis, and the process of cycling through the decision analysis multiple times to allow for modification as new intuitions and sensitivities are discovered and added. Clemen and Reilly (2013) focused the process more sharply in some details. They stated this form of decision analysis was "widely used in business and government" (p. 11) and several other more specific applications, such as product development, research, and negotiation. Although Phillips (1984) and even the current work by Clemen and Reilly (2013) began with business-world examples, Clemen and Reilly (2013) stated that "in the literature many of the reported applications relate to public-policy problems and relatively few to commercial decisions" (p. 11). They went on to list many specific areas of application, stating that their goal was not a complete listing of how requisite decision modeling is now used, but to create an awareness that this decision theory has become very widely used.

Clemen and Reilly (2013) also wrote about advances in the particulars of the requisite decision model process. While Phillips (1984) wrote of using a computer, accessible online, to create a scatterplot diagram, Clemen and Reilly (2013) included with their book (also used as a college textbook [Zilinskas, 2018]) the Palisade's Decision Tools® suite of six programs. Clemen and Reilly (2013) explained some of the statistical functions which the newer tools can do, far beyond the creation of a scatterplot. The role of sensitivity analysis was greatly expanded in Clemen and Reilly's (2013) book, largely because of two advances since 1984. First, the

software makes many more dynamically interactive calculations. Because of this capacity, as the decision makers insert new values for the attributes of the different choices and their own sensitivities, the interactions of those values can be immediately processed. Second, there is now a broad body of “subject-matter experts’ probability distributions for each alternative” (p. 247).

Clemen and Reilly (2013) did not contradict the seminal work of Phillips (1984). Instead, Clemen’s 848-page textbook reflected the advancement of requisite decision modeling since Phillips’s (1984) 20-page journal article. The basic features of requisite decision modeling, which can apply to the choices doctoral candidates make regarding degree and methodology types, have remained the same.

Related Literature

Research Methodology

Although quantitative research and qualitative research are both methods by which researchers gather information and draw conclusions, they are based upon two distinctly different theoretical frameworks. These two major divisions of methodology are usually presented as two very different processes with very different epistemological foundations. Epistemology is the branch of philosophy, which addresses the question of how people come to know anything and how people verify that knowledge (Gall, Gall, & Borg, 2007). The epistemological bases of quantitative research and qualitative research are very different, with quantitative being based on positivism (Creswell, 2013) and qualitative being based on constructivism (Creswell, 2013) or interpretism (Walsham, 2015).

Quantitative research and positivism. According to Gall et al. (2007), quantitative research seeks to gather numerical data that can be used to describe phenomena and then to analyze and interpret that data by statistics. Even as Alasuutari (2010) began an exposition of

how and why qualitative research is becoming more prominent in the social sciences, the article stated that “the default assumption about scientifically sound research is that [it is] based on randomized controlled trials” (p. 140). According to Warner (2013) random controlled trials are an element of quantitative research rather than qualitative research.

The interrelation of positivism and quantitative research is acknowledged in the research literature as well as in textbook expositions of the nature of quantitative research (Alasuutari, 2010; Creswell, 2013; Sale, et al., 2002; Walsham, 2015; Weber, 2004). Quantitative research is based on the principle that objective reality can be known and that the facts which are known are fairly consistent through time and across cultural groups (Creswell, 2013). The roots of quantitative research are deep within the epistemological system of positivism (Gall et al. 2007; Sale, et al., 2002). According to Alasuutari (2010), positivism was a product of the eighteenth-century Enlightenment. Just as the natural sciences, like chemistry and physics, focused upon objectively observable phenomena, so some people believed, social systems should be analyzed by the same principles of objective observation and recording of data in numerical form. Alasuutari (2010) referred to the eighteenth century as the origin of positivism, but another author set that date two centuries earlier. In Alfred North Whitehead’s work *Science and the Modern World* (1953, 1967), the Harvard philosopher and mathematician cited the Protestant Reformation as the origin of the emphasis on experientially based science, as different from speculation-based philosophy of ancient Greece and much of the Middle Ages:

At the Reformation, the Church was torn asunder by dissention as to the individual experiences of believers in respect to justification. . . . The emphasis lies upon the subject of experience. This change of standpoint is the work of Christianity in its pastoral aspect of shepherding the company of believers. (pp. 173-174)

In summary, Whitehead saw the emphasis upon individual observation of experience as the source of empiricism in modern science, and the philosophy of positivism is similarly based on the observation of phenomena.

Qualitative research and constructivism. In contrast to quantitative research methods, which have a kinship to the natural sciences and have roots reaching into the Protestant Reformation of the sixteenth century, qualitative research is new as a formal category. Still, qualitative practices do have precedents in the history of research. In tracing the origins of qualitative methodology, Alasuutari (2010) stated that the role of case studies and the recognition of the need to incorporate the viewpoints of the participants have a long association with the humanist outlook. Sociologists, according to Alasuutari (2010), have always published papers that were called “theoretical” or “non-empirical” (p. 142). These techniques have largely diminished in current research, being replaced by, or absorbed into, qualitative research. Alasuutari identified qualitative methods as “empirical social research” (p. 141). The term *empirical* is also applied to quantitative research (Park, 2005). However, in qualitative research the observed data is not recorded as numbers, but as verbal descriptions, and there is an emphasis on the role of human perception as influencing what is recorded. All of these emphases marking qualitative methodology shift the mode of research away from the objective, numerical format of quantitative research to the personal, verbally descriptive format characteristic of the qualitative research. In its current form, according to Creswell (2013), qualitative research is “holistic” (p. 300), with a broad field of vision, taking in many factors to acknowledge the complexity of a social situation, with lengthy verbal descriptions and analysis of spoken and written words, actions, and artifacts. It includes the “etic” (p. 292), or the researchers’ understandings, as well as the “emic” (p. 292), or the participants’ viewpoints.

Qualitative research is closely related to the philosophy of constructivism (Creswell, 2013). Vygotsky is credited with initiating the curriculum theory, philosophy, and methods of constructivism (Anderson-Levitt, 2008). Vygotsky (1978) emphasized the importance of social environments in learning, the process of scaffolded learning, and the zone of proximal development. Yet, constructivism has grown beyond the work of Vygotsky. Vygotsky's works have "been translated and applied very differently in Spain, Brazil, Ukraine, Mexico, and the United States" (Anderson-Levitt, 2008, p. 361). One article spoke of the various "constructivism(s)" and their relationship to identity in the European Union (Zeynep, 2014, p. 21).

The relationship between qualitative research and constructivism is clearly stated in various sources (Creswell, 2013; Sale, et al., 2002), and the relationship is evident in the natures of the two concepts. Beyond that, however, certain elements consistently appear in discussions of constructivism, and these elements also indicate linkage between constructivism and qualitative research. Just as qualitative research requires the researcher's reflection on the observed data (Creswell, 2013), so constructivism encourages reflection on one's experiences as a part of personal development (Conner, 2014). Just as qualitative research requires introspection, looking within one's self with emphasis on the emic and etic understandings of a situation, so constructivism "involves a consideration of what the learner already knows about themselves [sic]" (Conner, 2014, p. 275). Just as qualitative research focuses on the ontological question of reality, stating that "something is real when it is constructed in the minds of the actors in the situation" (Creswell, 2013, p. 299), so constructivism pictures students, for example, constructing within their own minds their different understandings of the nature of the learning situation and the objectives to be gained from that situation, while the teacher is just the

“facilitator or mediator of learning rather than someone who only takes on the role of imparting knowledge” (Conner, 2014, p. 274).

The term *interpretivism* is sometimes used instead of *constructivism* when explaining the philosophical basis of qualitative research (Sale et al., 2002; Walsham, 2015; Weber, 2004).

Walsham (2015) sums up interpretivism this way:

Interpretive methods of research adopt the position that our knowledge of reality is a social construction by human actors. In this view, value-free data cannot be obtained, since the enquirer uses his or her preconceptions in order to guide the process of enquiry [British spellings]. (p. 376)

This definition of interpretivism is very similar to Vygotsky’s (1978) and Conner’s (2014) descriptions of constructivism. Considering that all three of the authors who use the term *interpretivism* are part of the British Commonwealth (Sale et al., Canada; Walsham, United Kingdom; and Weber, Australia), it seems that *interpretivism* and *constructivism* are effectively equivalent terms in different dialects.

In summary, just as quantitative research is associated with the philosophy of positivism, so qualitative research is associated with constructivism. Qualitative research is a collection of observation-based methods, as is quantitative research, but qualitative methods and the philosophy of constructivism emphasize the personal insights of both the researcher and the participant, rather than striving for the impersonal objectivity that is associated with quantitative research and positivism.

Doctoral Degrees and Dissertations

Just as the different research methodologies—quantitative, qualitative, and mixed methods—are, in theory at least, distinct in processes and purpose; so the educational PhD and the educational EdD are usually presented as having clearly different functions.

Historical background of doctoral degrees and dissertations. The doctoral degree, as a separate entity from the doctoral dissertation, originated in Medieval Europe and spread to Britain, and from there to countries influenced by Britain, such as the United States of America and Canada (Noble, 1994). However, as Park (2005) pointed out, the thirteenth-century doctoral degree was really an approval to teach. It was not a higher degree: It was the only degree granted in a program of study for preparing teachers.

The modern concept of the PhD degree came much later. The current idea of the Doctor of Philosophy Degree originated with Wilhelm von Humboldt in Germany (Enders, 2016). According to Park (2005), when Humboldt founded the University of Berlin in 1810, he designed it as a research-based institution. It was here that the PhD became primarily a research-related degree. To earn a PhD, students were required to complete a rigorous course of studies, to write a thesis (the dissertation) that was approved by the faculty, and to make an oral defense of the thesis. Britain and the United States of America did not have higher education institutions with this degree of academic rigor, and students went from those countries to attend the University of Berlin and other German schools that followed Humboldt's model. These students then returned to universities in their own countries and brought with them the new PhD paradigm, including the dissertation. In the United States of America, the first dissertation written for a PhD program was presented in America at Yale University in 1861. The PhD degree was designed with a focus on the creation of new knowledge contributions (Park, 2005).

Presently, the PhD is commonly described as an academic credential based upon the creation or testing of theory in a given field (Boyce, 2012; Park, 2005). This focus on research is the golden key of universities: “These research universities ...will shape and be shaped by the new structure for the production of knowledge” (Geuna, 1998, pp. 265-266).

Park (2005) provided an in-depth analysis of the defining qualities of PhD dissertations, past and present. In the past, the dissertation was considered to be the candidate’s “magnus [sic] opus—a piece of research that could have a lasting impact on a discipline” (p. 198). With or without the major-life-work perspective, the topic must be worthy of research. Malacci and Kuhne (2014) emphasized the fact that the dissertation research should have social significance: The candidate should “choose an issue that matters, *i.e.*, the professional contribution” (p. 152). In recent years, though, another set of values has come to the fore, shifting the focus to competence and scale (Park, 2005). Regarding competence in research, the research should show originality, and the dissertation should make a new contribution to the field being studied, with advancement or critique of theory as a key element. Park discussed in depth the originality element, calling that the difficult part of defining the PhD, because so many things can be considered as original. Originality could be manifested by application of existing theories to new situations or even the examination of new data pertaining to the same research situation as tested before. Originality could involve taking existing theory and data and creating new theory, modifying existing theory, or revising the way in which the data were statistically analyzed. Regarding scale, this emphasis is a significant change in recent years. The fundamental, guiding principle of scalability is the three-year time frame that is considered to be an acceptable duration for the research-and-dissertation phase of doctoral work. Park (2005) described the newer vision of the dissertation as “a more pragmatic notion of a manageable piece of work, of a

scope and size that a student could reasonably expect to complete within three years” (p. 198). Scale relates to both length and quality. Park stated that most higher education institutions set a 100,000 word maximum for doctoral dissertations. The *magnum opus* view of the dissertation demanded that it make a significant contribution to the given field and that it be likely to effect some significant change. That also changed with the shift toward a product appropriate to a three-year project. With a touch of humor, Park reminded the reader that the dissertation is intended to result in a PhD Degree, not an international award for a lifetime of work, like a Nobel Prize. Park’s (2005) summation of the key elements expected in a PhD dissertation included these: original research, independence, and self-direction (with the guidance and help of a committee), and contribution to the knowledge base of the related field. Stock and Siegfried (2013) provided a similar analysis of the elements common to the PhD dissertation as “systematic research using logical argument and, often, incorporating empirical evidence in support of a hypothesis” (p. 2013).

The Doctor of Education Degree, with its distinct purposes, came along later than the Doctor of Philosophy Degree. The first EdD degree in the world was granted at Harvard University in 1920 (Nelson & Coorough, 1994) or 1922 (Walker & Haley-Mize, 2012). The EdD is commonly explained as equal in academic rigor to the PhD but different in purpose (Kantorski & Stegman, 2006). The focus of the EdD Degree was intended to be the application of research to solve local problems (Hochbein & Perry, 2013; Perry, 2014), rather than the development or refinement of theory to apply to universal categories (Park, 2005). The Australian Maxwell (2003) analyzed a shift from “first-generation” to “second-generation” professional doctorates (p. 279). The difference, as reported by Maxwell and others whom he cites, is that the earlier model was based on academic studies and a dissertation, like the PhD.

The later model relies more on a varied network of learning activities and seminars with more flexibility in the capstone project and its assessment. In the United States the major force currently at work at defining and refining the EdD degree, and hence the dissertation which is intended to prove a candidate's qualification for that degree, is the Carnegie Project on the Education Doctorate (CPED) (Boyce, 2010; Buss et al., 2017; Golde, 2015; Hochbein & Perry, 2013; Perry, 2014).

Doctoral degree choices. Since Yale University's first doctoral dissertation in 1861, this major composition has been a critical element in earning the doctoral degree in the United States. Its role has been to allow candidates to prove their competence in research related to field-specific theory (Park, 2005). The creation of the EdD at Harvard University, with its different focus on using research applied to the education field (in contrast to the creation, extension, or testing of existing theory), created a divide that continues to this day.

Debate regarding the EdD and the PhD. The theoretical distinction between the EdD and the PhD was intended to be clear: The PhD was designed to develop researchers who create new knowledge and theory, and the EdD was designed to develop researchers who use existing knowledge and theory to meet local educational needs (Boyce, 2012; Park, 2005). However, the distinctions are not always so clear. The coexistence of the two degrees within the education departments of the same institutions has resulted in questions about the level of preparation that either degree provides. Boyce (2012) stated that "we have done a very poor job of trying to simultaneously create both scholars and practitioners" (p. 34). Shulman, Golde, Bueschel, and Garabedian (2006) identified the same problem: trying to accomplish two very different purposes without sufficiently different processes. They stated that "the problems of the education doctorates are chronic and crippling. The purposes of preparing scholars and practitioners are

confused; as a result, neither is done well” (p. 25). Boyce (2016) and Shulman et al. (2006) commented on the level of preparation, but Perry (2015), the executive director of the Carnegie Project on the Education Doctorate, commented on the confusion at the level of the purpose of the degrees: “Eighty years of scholarly inquiry into the differences between the Ed.D. and the Ph.D. have resulted in little distinction or understanding” (p. 57). Shulman et al. (2006) addressed this also. The current state of these two degrees is in question both in the purposes they should accomplish and in the processes by which those purposes should be accomplished.

The Carnegie Project on the Education Doctorate (CPED) is now a major player in the development of the EdD (Perry, 2014). Although CPED-related articles often mentioned the distinction between the EdD and the PhD (Boyce, 2012; Shulman, et al. 2006; Perry, 2014; Walker & Haley-Mize, 2012), the distinction of the degrees is not the major purpose of the CPED. The prominent goal of this Carnegie Foundation-endowed work is the improvement of the EdD itself (Perry, 2015).

One proposed solution to the EdD/PhD confusion was offered by Shulman et al. (2006). They examined as a case study the restructuring of education doctoral programs at the University of Southern California Rossier School of Education. The University of Southern California solution followed the CPED model of involving the faculty in the project of analyzing and revising the programs. The school previously had one PhD program in education and four EdD programs. The resulting changes affected many levels of the programs. One resulting element seems superficial: one PhD degree and one EdD degree, with the EdD having four different “concentrations” (p. 25). Other changes suggest the true depth of change. The PhD requires students to be full-time; whereas the EdD can be accomplished in three years by students who are employed full time in their fields and are students part time. The greater research emphasis

of the PhD program is seen in the fact that those who sponsor PhD students must have published three articles, of which they have been sole authors, within the last three years. These changes, according to Shulman et al., have resulted in not only a better doctoral program in the school of education, but also in significantly higher enrollment in both degree programs, the EdD and the PhD. The solution suggested by Shulman et al. went a step further. Along with crafting programs having different courses and different forms of assessment, designed for different purposes, they suggested a different pairing of names, the PhD and the PPD, with the latter representing the professional practice doctorate. (The “emergence” of the professional practice doctorate in education is also mentioned by Buss et al., 2017, p. 1624). The new term emphasizes the approach taken for the PPD (or EdD) degree, “an extremely demanding, rigorous, respectable, high-level academic experience that prepares students for service as leading practitioners in the field of education (Shulman et al., 2006, p. 29). On the PhD side of the divide, the vision of Shulman et al. (2006) of the educational PhD included an emphasis on research (common in descriptions of the PhD) and the linking of that research to application in educational practice (not as often overtly stated in regard to the PhD). In contrast, the PPD would emphasize the scholarly basis of knowledge which could be applied in the educational world.

Social significance of doctoral degrees. It is not only the distinction of the degrees that is in question: It is also their perceived social significance. Several authors mention questions about the value of the doctoral degree and of dissertations in general (Amrein-Beardsly et al., 2012; Hochbein & Perry, 2013; Park, 2005). Academic rigor is an expectation in a doctoral program (Park, 2005), and that rigor lends credibility to the degree (Shulman et al., 2006). There are inconsistent expectations in the doctoral programs of various institutions of higher education.

Wilson, Cooper, and Johnson (2014) commented, “Given the various paths and methods used to instruct students in becoming research literate, it is little surprise dissertations vary in rigor and perceived value” (p. 91). In proposing their reforms, Shulman et al. (2006) pictured the current condition of the PhD as an “omnibus degree that signals all things to all educators” (p. 28). The questions about the value of the PhD, according to Buss et al. (2017), have led to a proliferation of alternate degrees in many fields, including the Doctor of Business Administration, the Doctor of Information Technology, the Doctor of Project Management, and, of course, the Doctor of Education, all of which Buss et al. put under the heading of professional practice doctorates. The EdD does not escape unscathed. Buss et al. stated that the EdD has received “intense scrutiny and crushing criticism” (p. 1625). In short, there are many criticisms of doctoral programs and the resulting degrees, both the EdD and the PhD.

Although some have questioned, as above, the value of doctorates and dissertations, even more people have commented on society’s perception of the EdD compared to the PhD, with the PhD consistently garnering more respect. The EdD has been called a “PhD lite” (Perry, 2015, p. 58; Shulman et al., 2006, p. 27) as pejorative of the perceived less-rigorous academic requirements. However, worthy of note are mentions of the EdD, not the PhD, as the degree promoting actual, applied change in the field of education (Boyce, 2012; Buss, et al., 2017; Shulman et al., 2006; Walker & Haley-Mize, 2012). Shulman et al. (2006) stated that their proposed reforms to the EdD—greater rigor than before, but shorter duration (three years part time for the research and writing of the dissertation) than their envisioned PhD—would result in greater respect for the PPD, their term for their re-engineered EdD program. All of the above might be summed up this way: The PhD has the greater social prestige, and the EdD has the greater power for immediate transformation of education.

There is more to the social significance of the EdD and PhD than how people evaluate their comparative prestige. Golde (2015) focused upon the social responsibility of those who earn doctoral degrees:

The problems facing us are larger and the stakes are higher than ever before. Climate change, dwindling water supply, poverty, demands for clean energy And if we cannot solve them, we bear a responsibility to equip the next generation to tackle these challenges. (p. 209)

While other authors addressed the collaboration of administration and faculty in revising doctoral programs and the related increase in enrollments (Shulman et al., 2006) or the response of students who are taking the revised EdD courses (Amrein-Beardsly, et al., 2012), Golde addressed the doctoral degree as something that brings responsibility. The EdD is commonly acknowledged as the degree of the educational practitioner (Walker & Haley-Mize, 2012; Wiggins, 2015), the person out working in the field, effecting change. Hochbein and Perry (2015) went on to urge that those who study to earn an EdD must be trained to make a difference in society. Citing the “increasing influence of research in educational policy” (p. 183), they stated that those who earn the EdD should be able to make a difference not only in their schools, but also in public policy. Devos and Somerville (2012) approached this from a different angle: Since tax money is part of the investment in doctoral programs, then the programs should be designed to offer something back to society. Devos and Somerville stated that, with a well-defined set of “doctoral knowledge” goals (p. 47), those who earn the EdD can change the world of education. All of these writers carry one common theme: Those who earn doctoral degrees have a responsibility to the greater society. The degree is not merely for the individual and his or her personal goals. This accords with the biblical view of social responsibility: “For everyone to

whom much is given, from him much will be required; and to whom much has been committed, of him they will ask the more” (Luke 12:48, NKJV).

Trends in Doctor of Philosophy and Doctor of Education Degree choices. When the first doctoral dissertations were written, the only option was the PhD. About 1920, when the EdD became an option, followed by a proliferation of other professional practice degrees (Buss et al., 2017; Kantorski & Stegman, 2006; Nelson & Coorough, 1994), some authors have sought trends in doctoral degree type choices. Nelson and Coorough (1994) studied a sampling of doctoral dissertations from 1950 through 1990. They found no significant pattern of one degree over the other (see Table 1).

Table 1

Nelson and Coorough’s Percentages of EdD Degrees Compared to PhD Degrees

	1950	1960	1970	1980	1990
<u>Degree</u>	<u>Percentage</u>				
PhD	65	30	47	54	56
EdD	35	70	53	46	44

Notes. PhD = Doctor of Philosophy Degree, EdD = Doctor of Education Degree
Adapted from “Content Analysis of the PhD Versus the EdD Dissertation,” by J. K. Nelson and C. Coorough, 1994, *Journal of Experimental Education*, 62, p. 163. Copyright 2015 by the Association for Experimental Education.

Kantorski and Stegman (2006) were also interested in which doctoral degree candidates chose to pursue, but their study differed from Nelson and Coorough’s (1994) study on three significant points. Kantorski and Stegman (2006) studied only doctoral degrees in music education; they included a third degree, the Doctor of Music Education (DME); and they aggregated all 148 degrees that they studied for the years 1998 to 2002 into one summary statistic for each quality that they examined—they did not attempt to show a trend. Still their

finding is not remarkably different from Nelson and Coorough's (1994) findings. Nelson and Coorough (1994) showed fluctuations in the comparative percentages, and their greatest difference was the 1950 65% to 35% split for the PhD and the EdD, respectively. Kantorski and Stegman's (2006) summary statistic showed the divide to be 67% for the PhD and 28% for the EdD. The DME degree came in at 5% (see Table 2). This is very close to the most extreme difference reported by Nelson and Coorough (1994).

Table 2

Kantorski and Stegman's Percentages of EdD, PhD, and DME Degrees

Degree	Percentage
PhD	66.89
EdD	27.70
DME	5.41

Notes. PhD = Doctor of Philosophy Degree,

EdD = Doctor of Education Degree,

DME = Doctor of Music Education Degree

Data from "A Content Analysis of Qualitative Research Dissertations in Music Education, 1998-2002," by V. J. Kantorski and S. F. Stegman, 2006, *Bulletin of the Council for Research in Music Education*, 168, p. 66. Copyright 2006 by Council for Research in Music Education.

Extensive searching of the National Center for Educational Statistics has not yielded statistics on the relative numbers of EdD and PhD Degrees awarded in the field of education during the three sample years of this study. Peer-reviewed sources state that the number of EdD Degrees (or professional doctorates, a general term including the EdD) awarded has greatly increased. For example, Maxwell (2003) stated that, beginning with the 1990s, the number of professional degrees "has burgeoned" (p. 279). Similarly, Buss et al. stated that "professional practice doctorate (PPD) degrees have emerged in great numbers and prospered" (p. 1625).

The EdD and the PhD are the two most-often-sought doctoral degrees in the field of education, but the very nature of the degrees is still in question (Boyce, 2012; Shulman, Golde, Bueschel, & Garabedian, 2006). They are considered to have social significance for institutions of higher education, for the people who earn the degrees, and for social policies and practices. The relative merit and the perceived value of these two degrees is debated. Yet, no trend analysis of these degrees has been published since 1994. There is a need for an updated study of the EdD/PhD degree choice.

Dissertation Research Methodologies

Much of the current literature on the EdD/PhD divide dealt with the lack of distinction between the degrees. The two major methods of research, qualitative and quantitative, having their roots in different philosophies and having different sets of practices, should be very distinct. Still, the literature shows concern about the conflation of these two degrees (Perry, 2015).

Debate regarding quantitative and qualitative methodologies. Qualitative research has an ontological basis differing significantly from the basis of quantitative research. Ontology is the realm of philosophy that examines what is real (Creswell, 2013). Qualitative researchers commonly use terms such as *multiple truths* (Nordstrom & Happel-Parkins, 2016; Sale et al., 2002; Zamani-Gallaher, Turner, Brown-Tess, & Thrill, 2017) and *multiple realities* (Creswell, 2013; Nordstrom & Happel-Parkins, 2016). However, the research articles rarely explain what terms like *multiple realities* allow. Researchers from both major methodology camps tend to present their basic assumptions, if at all, without adequate explanation (Weber, 2004). One exception is Weber (2004), a journal editor who described himself as a positivist (one holding a frame of reference more associated with quantitative research) who had an interest in learning

about and using more interpretivist (qualitative) research. With a bit of humor and with an attempt to frame this matter in the most positive sense, Weber stated,

First, surely some kind of reality exists beyond our perceptions of it! ... I gave the example of the "reality" that would occur if one were to step off the ledge outside the window of my office (given that my office is on the third floor of my building). I've yet to find a colleague who calls herself/himself an interpretivist willing to undertake the experiment to show me that the outcome I'm confident would occur is a perception rather than a reality! (p. v)

Weber was not creating a straw-man argument against qualitative research. In the same article he wrote, "Clearly, both positivist and interpretivist approaches to research have substantial value" (p. iv). Instead, he was contending that researchers on both sides of the methodological divide need to clearly express their philosophical assumptions and to understand the assumptions of those who work from different methodologies. Regarding his third-floor-ledge example, he stated,

I suspect it is easier to obtain agreement about certain kinds of phenomena (e.g., what happens if we step off the ledge on the third floor of a building) versus other kinds of phenomena (e.g., what happens when several individuals interact with each other, or what some person believes when she or he observes some event)." (p. v)

Sale et al. (2002) supported this conclusion: "Certain phenomena lend themselves to quantitative as opposed to qualitative inquiry and vice versa in other instances" (p. 48).

Even though Weber posited a very reasonable reading of the multiple realities concept, the results of any research, whether quantitative or qualitative, require careful analysis. This consideration includes at least four questions. First, are the research results being used for their

intended purpose? Qualitative research is not intended to produce conclusions which may be generalized to a larger population and, therefore, be used as a basis for educational or social policy. Speaking of case studies in particular, Creswell (2013) wrote that “the researcher might focus on a few key issues . . . not for generalizing beyond the case, but for understanding the complexity of the case” (p. 101). In the same chapter, Creswell called generalizability “a term that holds little meaning for most qualitative researchers” (pp. 101-102). Second, are the research results presented with acknowledgement of the necessarily filtered perspective? “We always bring certain beliefs and philosophical assumptions to our research” (Creswell, 2013, p. 15). Creswell went on to say that qualitative research must include a discussion of the “beliefs and assumptions which inform our research” (p. 15). He stated that “qualitative researchers are embracing the idea of multiple realities. Different researchers embrace different realities, as do the individuals being studied” (p. 20). He concluded this section with the caution that researchers must report the personal nature of their own ideals and beliefs that shape their research. Third, is the researcher skillful? Creswell (2013) warned that qualitative research, properly done, is as demanding as quantitative research and should not be pursued as a method less rigorous than mathematically based quantitative research. He discussed five forms of qualitative research and concluded each section with an analysis of the difficulties inherent to each form. For example, narrative research requires extensive knowledge not only of the person participating in the study but also of the contexts in which the participant lives. In grounded theory, the researcher must eliminate “as much as possible” his or her own “theoretical ideas or notions” (Creswell, 2013, p. 89). Creswell continued his critique of the demanding nature of qualitative research through each of the forms he described. Fourth, is the researcher honest? Nordstrom and Happel-Parkens (2016) described their practice of presenting qualitative work in

the language of other theoretical frameworks, something they called “methodological drag” (Nordstrom & Happel-Parkens, 2016, 149). The term *drag* refers to the practice of gay men dressing as women (Moore, 2013). Nordstrom and Happel-Parkens (2016), who described their theoretical system as both “poststructural and posthumanist” (p. 151), used other systems of terminology as a “masquerade” (p. 149) to communicate their research and conclusions to people who are not accustomed to their form of qualitative research. To communicate their ideas, they “enact more conventional qualitative research methodological approaches in [their] work with students and faculty members” (p. 151). Just how this “performance” (p. 150, 151) is done depends on what “power/discourse network” is the context of the performance, but Nordstrom and Happel-Parkens (2016) stated that the goal is always “subversive” (p. 149). The goal of the subversion is always persuasion: “For us to convince others of a certain methodological performance, we must use the discourses of the networks in which that methodology is situated” (Nordstrom & Happel-Parkens, 2016, p. 150). This method intends to use stealth to break down commonly accepted ideas: “We slip between networks, we disrupt and interrupt taken-for-granted iterations of methodologist” (Nordstrom & Happel-Parkens, 2016, p. 150). (This usage of *methodologist* does not seem to be an unintentional error. Nordstrom and Happel-Parkens (2016) consistently used that word to refer to the broad ideas of a methodology, not just to refer to the person who employs those ideas.) Nordstrom and Happel-Parkens (2016) mentioned other systems of qualitative research as their target areas. The article never mentioned any form of the word *quantitative*, but the authors did mention positivism as a target, and positivism is the theoretical framework of quantitative research. Nordstrom and Happel-Parkens (2016) stated that, by their verbiage, they create “dense networks, or multiplicities, that disrupt positivism’s stable and coherent conceptualization of identity, and, in so doing, create a multiple, contingent

subject” (p. 150). Throughout Nordstrom and Happel-Parkens’s (2016) explanations of their “methodological drag,” (p. 149) the words *performance* (used 49 times in the article), and *enact* (used 6 times in the article) emphasized the nature of their work with students and colleagues as presenting their work deceptively, as something different from what they really have done.

This sort of “subversive performance,” (Nordstrom & Happel-Parkens, 2015, p. 149) hidden in terminology having different meanings to practitioners of other research methodologies, fits well with the ideas that Alinsky (1971) propounded in *Rules for Radicals: A Pragmatic Primer for Realistic Radicals* (1971). Alinsky (1971) reframed the question of morality. Addressing the matter of whether the virtue of the ends can justify the corruption of the means to those ends, he stated: “The perennial question, ‘Does the end justify the means’ is meaningless as it stands; the real and only question regarding the ethics of means and ends is, and has always been, ‘Does this *particular* end justify this *particular* means’” (Alinsky, 1971, p. 25). Alinsky (1971) admitted the word *corruption* into the debate, but he excused it: “Life is a corrupting process from the time a child learns to play his mother off against his father in the politics of when to go to bed; he who fears corruption fears life” (pp. 24-25).

Deception is not integral to all research; neither is it part of all qualitative research. Creswell (2013), in presenting various forms of qualitative research, repeatedly presented cautions against misuse, stressing the different function and nature of qualitative research (e.g., exploring an area, not propounding generalizable theory). He also stressed the practices that facilitate honest research for each of the five formats that he presented. However, Creswell (2013) also recognized that both researchers and those who peer-review the research may have problems with fairness:

These assumptions are deeply rooted in our training and reinforced by the scholarly community in which we work. ... Unquestionably reviewers make philosophical assumptions when they evaluate [research]. Knowing how reviewers stand on issues of epistemology is helpful to author-researchers. When the assumptions between the author and the reviewer (or other journal editor) diverge, the author's work may not receive a fair hearing. (p. 19)

Good research demands, if not the ideologically neutral ideal of positivism, at least the clear indication of which ideology directs the researcher. Creswell (2013) stated that one of the practices of qualitative research reporting should be a clear presentation of the researcher's worldview. This explanation would help readers understand the lens through which the researcher interpreted subjective data and, therefore, gain more meaningful information from the research. Still, Creswell (2015) also stated that "although some researchers may not realize it, they make assumptions about knowledge ... and how it may be obtained" (p. 539). As Creswell (2013) overviewed nine worldviews *interpretive frameworks*, he stated concepts in some of those worldviews that overlap with Nordstrom and Happel-Parkins's (2016) desire to produce change by "disrupt[ing] positivism's stable and coherent conceptualization of identity" (p. 150) and Alinsky's (1971) intention to establish his concept of social justice, particularly regarding distribution of wealth. Creswell (2013) quoted a source which called postmodernists "armchair radicals" (p. 27). The term *radical* links Nordstrom and Happel's (2016) ideas to the title of Alinsky's (1971) book, *Rules for Radicals*. Pragmatists focus on "what works. ... Thus, instead of a focus on methods, the important aspect of research is the problem being studied" (Creswell, 2013, p. 28). This statement is similar to Alinsky's (1971) discussion of morality in regard to ends and means.

The summation of this debate on qualitative methods of research is that qualitative research is very good at analyzing the depth and detailed complexity of significant issues, but it must be read with cautious consideration of how the conclusions are being derived and presented. Is the study under consideration exploring the richness of a case, a story, or a culture; or are the conclusions presented as generalizations that should be applied to other situations? Even if a researcher presents the necessarily individualistic nature of his findings, not every person who cites that research in summary form, whether in corporate board rooms, in conferences on educational policy, or in courts of law, will effectively use and communicate to others the limitations of the research findings.

Quantitative research. Quantitative research has its own problems in epistemology. In a textbook presenting methods of statistical analysis, Warner (2013) presented many cautions about errors and assumptions that can result in misleading conclusions. Warner referred to statistical “sleight of hand” (p. 83) and stated that statisticians disagree about whether the use of null hypothesis significance testing is valid. Warner’s (2013) cautions can be grouped into three categories: errors of intent, errors of implementation, and errors of interpretation. Regarding researchers’ intent, Warner (2013) wrote, “In everyday thinking, people have a strong preference for stating hypotheses that they believe to be correct and then looking for evidence that is consistent with their stated hypothesis” (p. 83). This “everyday thinking” is not different from academic and scientific research, for Warner stated in the same paragraph, “Researchers often (but not always) hope to find evidence that is inconsistent with the stated null hypothesis” (p. 83). The word *hope* speaks of bias. In the discussion of exploratory data analysis and confirmatory data analysis, Warner (2013) stated that researchers can “hide the fact” (p. 181) that

they attempted several variations of the statistical analysis until they found the method that confirmed their desired outcome.

Regarding errors of implementation, Warner (2013) made suggestions of ways to improve research design, but the need for such improvements suggests that research can be imperfect. For instance, after stating that the ideal method of sampling within a population requires random sampling from a large population with carefully delimited qualities, Warner (2013) said that “in many real-life situations, researchers use convenience samples” (p. 83). Another potential error in implementation is the Type I statistical error. This is a commonly acknowledged consideration in regard to null hypothesis testing (Warner, 2013). In null hypothesis significance testing, the researcher first states the research question(s), what she or he expects to find to be true of a situation. Then, the researcher states the opposite, the null hypothesis. Finally, the experimental data are analyzed to determine whether they show that the results are likely to have resulted from coincidentally selecting unusual data points. A predetermined level, often less than 5% likelihood, is established to reject the null hypothesis. The Type I error is the rejection of the null hypothesis, when it was indeed the more accurate presentation of reality. In addition to critiques of the sampling procedures, Warner (2013) warned about errors in data screening, stating that analyses of flawed data sets “can yield misleading results” (p. 125). Warner (2013) explored various errors of sampling that ranged from impossible data (such as an answer of three on a descriptive characteristic set with only two categories) to dishonesty in the participants (citing the example of social desirability bias, giving answers that deliberately align with or against what the participant believes that the researcher considers to be good). Quite apart from errors in data screening, Simmons, Nelson, and Smithsohn (2011) stated that “flexibility in data collection, analysis, and reporting dramatically

increases actual false-positive rates. In many cases a researcher is more likely to falsely find evidence that an effect exists than to correctly find evidence that it does not” (p. 181). Warner (2013) also cautioned against “excess flexibility” in data screening (p. 181). Skillfully conducted quantitative research will lessen these errors of implementation, but no amount of skill can eliminate errors of intent if those exist.

Finally, regarding errors of interpretation, Warner (2013) mentioned problems for the researchers and for the consumers of research. For those consuming research, Warner (2013) stated that “many other critics” (p. 83) point out that the null hypothesis approach does not tell researchers what they really want to know. Such tests will not show that something is true or effective, but that its antithesis is probably not true or effective. For readers of research, Warner (2013) stated that the format of the null hypothesis is difficult: “Double negatives are confusing, and the search for ‘disconfirmatory’ evidence in the NHST [null hypothesis significance testing] is inconsistent with most people’s preference for ‘confirmatory’ evidence in everyday life” (p. 83).

Research can never be completely objective. Albert Einstein (1938), the consummate physicist, stated this:

Out of the multitude of our sense experiences we take, mentally and arbitrarily, certain repeatedly occurring complexes of sense impression (partly in conjunction with sense impressions which are interpreted as signs for sense experiences of others), and we attribute to them a meaning—the meaning of the bodily object. (p. 350)

That is, all people, including researchers, select data that has been received through the five senses, ignoring other data, and assign meaning to that data in the construction of ideas, or concepts, which are not found in the mere objective sensory input. Schaeffer (1972) added this

further concept: “The observer is always there and always makes the conclusion, and he is never entirely neutral” (p. 198). Both of these thinkers, Einstein (1938) the physicist and Schaeffer (1972) the Christian philosopher, make the same observation: purely objective research, reduced to the certainty of mathematical calculations, cannot happen. The balance to this is that properly done research seeks to overcome that limitation. Warner (2013), writing about quantitative research, and Creswell (2013), writing about qualitative research, proposed many procedures to help minimize researcher bias. Researchers who seek to avoid bias can take meaningful steps toward that goal. Still, objectivity in research is a high goal that, according to some, will never be fully achieved.

The criticism of quantitative research is abundant, yet such research can be useful. Warner (2013) used words such as “a large number of critics” (p. 84), “confusing” and “unclear” (p. 83), “misleading” (p. 125), and “hides the fact” (p. 181) in reporting criticism of certain research practices. In spite of all the limitations of quantitative research, both in technical processes and in researcher bias, quantitative research can be useful. Warner (2013) stated that the distinctive strength of quantitative research is the simple “yes/no” (p. 84) outcome. Warner proposed an example: If one must decide whether a drug will treat a certain disease, a quantitative study is the best system available. However, in a contrasting example, Warner considered research about something less objectively observable, such as development of theory. In such a study, Warner said, the results of any one study should be considered in light of the cumulative results of many studies. The key with quantitative research is, as it is with qualitative research, understanding the inherent problems and valid uses of the research methodology and then expressing conclusions with clear statements of the limitations of the study.

Mixed methods research. Mixed methods research (MMR) combines quantitative and qualitative research procedures into one study or a series of studies (Archibald, 2016; Creswell, 2015). Creswell (2015) stated that this combination provides “better understanding of the research problem and questions than either method by itself” (p. 537). Creswell’s (2015) definition is notable in that it stated the improved understanding is not only about the conclusions, but also about understanding the “problem”: the phenomenon, person, or group being studied, and the “questions”: the starting point of the researcher’s inquiry. Alasuutari (2010) added that the combination of methods increases the validity of the studies. (The confidence in MMR for increasing validity is not unanimous. Sale et al. (2002) contradicted Alasuutari [2010] on the matter of whether evidence from a quantitative paradigm can be used to cross-validate evidence derived from a qualitative paradigm.) Gall et al. (2007) focused on yet another set of benefits from this combination. They stated that MMR “can provide richer insights and raise more interesting questions for future research” (Gall et al., 2007, p. 32). Here, the benefits were proposed to be in the findings, the “insights,” of the current study and in the identification of other areas for future research. Archibald (2016) emphasized the idea that a combination of the two broad methodologies, quantitative and qualitative, into mixed-methods research results in methods which will enable greater gains than could be accomplished by the use of either alone. The combination, Archibald (2016) asserted, could also be better than the independent application of each of the methods to the same problem. Archibald (2016) wrote, “As MMR expands in popularity and complexity, meaningful collaboration may foster opportunities to approach intricate research problems from new and synergistic angles” (p. 229). These sources indicate high hopes that the combination of quantitative and qualitative methods can enhance several basic components of research.

A key element of qualitative research is triangulation, defined by Creswell (2013) as the “use of multiple and different sources, methods, investigators, and theories to provide corroborating evidence for validating the accuracy” (p. 302). Triangulation is commonly acknowledged as important in qualitative research (Creswell, 2013; Neuendorf, 2017; Sale et al., 2002). Just as quantitative research bases its epistemological surety on impartial observation of objective, stable reality (Creswell, 2013), qualitative research seeks multiple sources of information that lead to the same conclusions as its means of affirming the reality of the conclusion which the researcher draws. For instance, in “Rethinking Subcultural Resistance: Core Values of the Straight Edge Movement,” Haenfler (2004) gathered insights about the Straight Edge (sXe) culture as a participant-observer; through in-depth interviews with sXers in his area, deliberately selecting individuals to represent different genders, ages, and degrees of commitment to that culture; and by observing and interviewing sXers from various locations outside of his immediate area. This type of triangulation relies on different sources of information for surety. This triangulation, however, does not factor in the worldview lens of the investigator: one investigator was doing all of the information gathering.

Investigator triangulation (IT) is proposed by Archibald (2016) as a factor that can make MMR distinctively strong because IT acknowledges the worldview issue. IT represents an attempt to balance the biasing power of reliance upon the perceptions of the investigators and participants in qualitative research. IT deals with the use of multiple researchers in addition to the multiple sources of data to establish credibility of the subjectively-derived conclusion. The inclusion of researchers representing different mindsets and worldviews is implied in Archibald’s (2016) statement that IT is useful for “promoting the spirit of diversity characteristic of MMR” (p. 219). Clarity between the term *investigator triangulation* and the more general

term *triangulation*, which in Creswell's (2013) definition, includes the possibility of multiple investigators can be achieved by use of Neuendorf's (2017) term "triangulation of methods" (p. 23) as the category of triangulation that is different from "investigator triangulation."

The rise of mixed methods, although promising a pathway for doing better research than either quantitative or qualitative research could allow alone, still comes with inherent dangers. Serious research flaws that can result from mixed methods are noted with terms like "obfuscation" and "conflation" (Lydgate, 2016, p. 423). In context of a World Trade Organization legal dispute, Lydgate (2016) stated that "in some disputes, qualitative findings about the existence and nature of competitive relationships are presented using the language of quantitative market analysis" (p. 424). This means that, whether by deliberate subterfuge or careless logic, the use of both quantitative and qualitative evidence and methods together can present another avenue for presenting qualitatively derived conclusions in the nomenclature of empirical and quantitatively evidential research. These research conclusions can result in erroneous or even detrimental choices as research is cited to influence policy and court decisions.

In spite of the optimism of some, the synthesis of quantitative and qualitative methodologies does not necessarily make the research better. Sale et al. (2002) warned that "mixed-methods research is now being adopted uncritically by a new generation of researchers who have overlooked the underlying assumptions behind the qualitative-quantitative debate" (p.44). They warned that the loss of understanding of the differences between the theoretical frameworks underlying these different methodologies can lead to their being inappropriately employed. They also asserted if people do not understand these different research frameworks, that misunderstanding could cloud the findings of MMR. They stated, "The truth is we rarely know the extent of disagreement between qualitative and quantitative results because that is

often not reported” (Sale et al., 2002, p. 47). They did not argue against the use of mixed methods; instead, they argued for distinction in the purposes of MMR. They stated, “Because the two paradigms do not study the same phenomena, quantitative and qualitative methods cannot be combined for cross-validation or triangulation purposes. However, they can be combined for complementary purposes” (Sale, et al., 2002, p. 43). Archibald (2016), a proponent of MMR, still warned of potential sources of confusion: “Beyond the technical level, philosophical and methodological considerations are often entangled with [collaborative strategies] at the more procedural level” (Archibald, 2016, p. 229). Archibald (2016) then explained that, in the blending of different modes of research, problems of ontology and epistemology “infiltrate” (p. 229) the technical issues. “Whether acknowledged or unrecognized, such preferences [ontological and epistemological orientations] may manifest as affinities for particular MMR designs or contribute to nonintegration of qualitative and quantitative data through methodological favoritism ..., thereby acting as a barrier to effective collaboration” (Archibald, 2016, p. 229). As with quantitative research and qualitative research, the value of mixed-methods research is dependent upon the skill and honesty of the researcher.

Social significance of research methodology. From the Twitter-feed to the scientific journal, people look to various sources for information on which to base decisions. These decisions have significance, sometimes of personal and sometimes of national or international importance. The issues of researcher skill and integrity, as discussed above, affect the quality of information available.

Beyond the researchers, there is another level at which philosophical mindsets and levels of skill affect what knowledge is considered worthy of bringing before the public. In the publishing of peer-reviewed journals, the worldviews of the reviewers can also determine what is

published. Walsham (2015) described the power of the journal to homogenize available research: “A journal can be viewed as a machine ... which ties together a network of interested parties and controls aspects of their behaviour, such as the definition of high quality research” (p. 382). With similar observation of the power of the journal, he also said that “journals can be considered as machines or stratagems for enrollment and control” (Walsham, 2016, p. 377). He specifically cited academic journals as cultures which perpetuate restricted sets of beliefs and standards to create a body of writers “who do not question existing paradigms and power structures” (Walsham, 2016, p. 383).

“Knowledge is power” is not only a familiar maxim, but also the name of a charter school program, the Knowledge is Power Program (KIPP), which has social and economic goals as well as educational goals (Clarke, 2015; Maranto, 2014). Clark (2015) accused KIPP of reflecting “neoliberalism’s obsession with knowledge as control and mastery” (p. 71). On the other side, Maranto and Ritter (2014) defended KIPP, referring to “the now substantial empirical literature on KIPP schools” (p. 237) and saying that “social justice based criticisms of KIPP betray a limited understanding of how these schools operate” (p. 239). The availability of knowledge, necessarily filtered through the theoretical frameworks of research methodologies and the worldviews of both researchers and peer reviewers, is critical to this debate on educational policy and methods, a debate which affects children and adolescents in 141 schools.

At another level, even deeper than the worldviews or prejudices of researchers and peer-reviewers, is the assertion of Mantzoukas (2005) that bias is a necessary and positive element of qualitative research. He stated that “the paradigmatic rules [of nonpositivist research] require that these biases should be included rather than excluded from the study” (Mantzoukas, 2005, p. 279). Bias is generally presented as a bad thing (Archibald, 2016; Devos & Somerville;

Hochbein & Perry, 2013). However, Mantzoukas (2005) stated that those who reject positivism believe the following:

Bias is understood as inseparable from the individual researcher, because phenomena are always filtered through the subjective understandings of the individual conducting the study. Therefore, the researcher can have neither a “God’s eye-view” of phenomena, nor be an objective “eye-witness,” but can only be an “I-witness,” always filtering phenomena through subjective understandings. (p. 283, with quotes from Wittgenstein, 1953)

This view, according to Mantzoukas (2005), “has been adopted by researchers conducting primarily qualitative research studies” (p. 283). Mantzoukas (2005) does not reject the goal of minimizing bias in quantitative research, but he asserted that qualitative research ought to be biased.

Although quantitative research is focused on observation of “objective reality” (Gall et al., 2007, p. 650), that focus is not an assurance of unbiased reporting either. Huff (1954, 1982), with ironic humor, wrote a book about how to lie with statistics. More seriously, Boudana (2011) stated that, for some writers, journalistic objectivity “is considered doomed to failure and dismissed as an unattainable standard” (p. 385), adding that “some professors” (p. 385) assert that objectivity in journals is not even a desirable goal. This echoes the statements of Mantzoukas (2005). Boudana (2011) associated journalistic objectivity with empirical science, as epitomized in the work of Sir Isaac Newton. Empiricism holds that sensory perception provides the data with which the mind works (“Empiricism,” n.d.). This aligns the approach to journalism as an empirical activity with the methods of quantitative research, which, according to Gall et al. (2007) focuses upon “objective reality” (p. 650). Although Boudana’s (2011)

article argued in favor of unbiased journalism, stating that it is difficult but attainable, the article also provided a catalogue of charges that others have made against the concept of, the possibility of, and even the propriety of, objectivity in journalism. Criticisms included are that journalists are unavoidably biased by their political frameworks, that the news organizations are the cause of biases that will override the mindsets of individual journalists, that journalists “are prisoners of their social environment” (p. 392), and that all language is necessarily biased by the way cultures establish and change the meanings of words.

People look to others, often researchers and journalists, to gain knowledge beyond their personal experience. Whether the source is peer-reviewed research and journalism in print, on the air, or online, there is a possibility of bias. In fact, some of the arguments in the paragraph above would argue for the certainty of bias. Even though Mantzoukas (2005) associated bias particularly with qualitative research, the presence of bias in available knowledge is always a possibility, whether in quantitative or qualitative research. Understanding the methods, purposes, limitations, and dangers of research methods is important.

Trends in dissertation methodology choices. The origins of quantitative research have been ascribed to the Reformation of the 1500s, which emphasized individual observation (Whitehead, 1953, 1967), and the Enlightenment of the 1700s, which emphasized reason and brought the development of quantitative methods (Alasuutari, 2010). Quantitative research in the social sciences paralleled the rise of the data-driven approach to the physical sciences (Alasuutari, 2010). As early as 1690, Sir William Petty of England clearly stated his approach to research in *Political Arithmetick*, a book about economics:

Instead of using only comparative and superlative Words, and intellectual Arguments, I have taken the course ... to express my self in Terms of *Number, Weight, or Measure*; to

use only Arguments of Sense, and to consider only such Causes, as have visible Foundations in Nature; leaving those that depend on the mutable Minds, Opinions, Appetites and Passions of particular Men, to the Consideration of others. (n.p.)

As well as being seminal in its intent to apply statistics, which are characteristic of quantitative methodology, to a social science, Petty's statement also acknowledged a contrast to what is now called qualitative methodology. Petty refers to "words" and "intellectual Arguments" (Petty, 1690, n.p.), terms which overlap with the rich verbal descriptions and the researcher's "abstracting ... to the larger meaning of the data" (Creswell, 2013, p 298) which are characteristic of qualitative research. In the 1930s, methods of sampling, gathering, and analyzing survey data became more systematized (Alasuutari, 2010), marking a major shift in application of the survey method. Alasuutari (2010) described the rise of quantitative studies in the social sciences, assigning that rise to the 1970s, and stating that this was the "golden age of evaluation" (p. 141). This was followed by a movement away from quantitative research concurrent with the movement toward private control of social services. The quantitative trend rose again in the 1990s and 2000s with an emphasis on data as being required to justify policies. Citing British journals, Alasuutari (2010) noted a trend toward fewer quantitative research articles compared to all other methodologies (see Table 3). Alasuutari (2010) stated that journals in the United States of America show a similar pattern, with a decline in quantitative articles beginning about 1980.

Table 3

Alasuutari's Percentages of Quantitative Articles in British Journals

	1960s	1970s	1992- 1994	1999- 2000
% Quant	44	36	31	5*

Note. % Quant = percentage of articles using quantitative methods of data analysis.

* Alasuutari (2010) expressed this as “about one in 20.”

Data from “The Rise and Relevance of Qualitative Research,” by P. Alasuutari, 2010, *International Journal of Social Research Methodology*, 13, pp. 140-141. Copyright 2010 by Taylor & Francis.

Qualitative research, as an organized body of methods called by that name has a much later origin, about the 1960s or 1970s (Alasuutari, 2010). Many sources speak broadly of the increasing number of qualitative articles (Alasuutari, 2010; Canagarajah, 2016), but few cite exact numbers or percentages. Kantorski and Stegman (2006) conducted a study of 148 doctoral dissertations in the field of music from 1998 to 2002 and reported the percentages that were qualitative (see Table 4).

Table 4

Kantorski and Stegman's Percentages of Qualitative Dissertations in Music

	1998	1999	2000	2001	2002
% Qual	23	22	19	23	24

Note. % Qual = percentage of articles using qualitative methods.

Adapted from “A Content Analysis of Qualitative Research Dissertations in Music Education, 1998-2002,” by V. J. Kantorski and S. F. Stegman, 2006, *Bulletin of the Council for Research in Music Education*, 168, p. 67. Copyright 2006 by Council for Research in Music Education.

MMR is definitely on the rise, but its origin is indefinite. Creswell (2015) stated that “since the 1930s” (p. 538) researchers in the social sciences, including education, have used multiple “methods of data” (p. 538). Creswell (2015) attributed “multitrait, multimethod” methodology to Campbell and Fiske in 1959 (p. 538). The earliest reference to the term

multimethod found in a search of a university online journal database was Brewer and Hunter's (1989) book *Multimethod Research: A Synthesis of Styles*. Since then, the increasing number of references to mixed methods in peer-reviewed journals justifies Thaler's (2017) speaking of the rise of MMR "in recent decades" (p. 59). Alasuutari (2010) dated this rise from the late 1980s, adding that the *Journal of Mixed Methods Research* began publication in 2007. Archibald (2016) wrote of MMR as then "expand[ing] in popularity" (p. 229).

Research has power to change society, and the three major types of research—quantitative, qualitative, and mixed methods—have very different philosophical bases, including a debate about the propriety of deliberate bias. Yet, no study in the trends in researchers' choices among these methods has been done since Alasuutari's study in 2010. This indicates a need for this proposed study of the choices in methodology in doctoral dissertations.

Summary

This chapter examined the three major research methodology choices: quantitative, qualitative, and the combination of these in mixed methods. Attention was given to the theoretical frameworks behind the methods, the significance of the methods, and trends in doctoral candidates' choices among methodologies. The vastly different theoretical frameworks of these methodologies, positivism and constructivism, have potential for promoting many different directions in educational, governmental, and social policies. This chapter also examined education doctoral degree types, the EdD and the PhD, in terms of their historical backgrounds, their social significance, and trends in doctoral candidates' choices between degree types. The literature showed that these degrees have great significance not only for the individuals earning them and the institutions granting them, but also for society. Researchers and practitioners establish and execute theoretical and practical changes in education and in

many other areas of society. The historical background of the degree types, the EdD and the PhD, and choices that doctoral candidates make between them reflect a slow but constant condition of change. Also in a state of change are the percentages of research studies employing the different methodologies, qualitative, quantitative, and mixed methods. Considering the power and the importance of both the doctorate and the methods of research, and considering the fact that no study exists that tracks the trends in degrees and methodologies since Nelson and Coorough's (1994) study of degree choices in 1994 and Alasuutari's (2010) study of methodology choices in 2010, there is a need to study the trends in doctoral candidates' choices of degree types and methodologies in recent years.

CHAPTER THREE: METHODS

Overview

The purpose of this content analysis and trend study of archived data was to examine recent trends in the choices that doctoral candidates in the field of education have made regarding the type of doctoral degree to seek, the Doctor of Education Degree (EdD) or the Doctor of Philosophy Degree (PhD) and the type of methodology employed in the dissertation research: quantitative, qualitative, or mixed methods. It used content analysis of samples of dissertations randomly drawn from ProQuest Dissertations and Theses Global database (hereafter ProQuest) representing doctoral work done in the state of Virginia in the years 2007, 2012, and 2017. Chapter Three presents the design of this study, the research questions, the null hypotheses, the participants and setting, the variables, the procedures, and the data analysis methods.

Design

Two quantitative research designs converged in this study. The data collection design was a content analysis of archived data. The data analysis method was trend analysis. Gall et al. (2007) identified content analysis as appropriate for documents, which are described as “written materials” (p. 288). This description precisely fits the dissertations that were considered, as distinct from audio and video recordings, also suitable for content analysis. Gall et al. (2007) stated, “In quantitative research, the analysis of documents typically involves content analysis” (p. 288). Content analysis involves the preselection of specific, identifiable, and classifiable categories of data. The categories analyzed in this study were the year of dissertation publication, the degree sought, and the methodology employed. Neuendorf (2017) identified trend studies as “longitudinal survey designs that involve identifying a population and analyzing

changes within that population over time” (p. 382). This definition describes this study well. In this study the survey was the content analysis of archived data, a pattern used in other published articles (Buss et al., 2017; Kantorski & Stegman, 2006; Nelson & Coorough, 1994). Gall et al. (2007) stated that if documents are used for content analysis, the selection and analysis of those documents must be “systematic” (p. 288). The systematic procedures for sample selection and content analysis are presented in the Procedures section of this chapter.

Other published articles have used content analysis for similar studies, notably Nelson and Coorough’s 1994 study, “Content Analysis of the PhD Versus the EdD Dissertation.” Similar to the current study, Nelson and Coorough (1994) analyzed a sampling of dissertations for the last year of each decade, from 1950 to 1990. Their study first grouped the dissertations by degree type, EdD and PhD, then examined each dissertation on the basis of seven characteristics, e.g., gender of the author, research design employed, and statistical analyses that were used. They used the chi-square test to determine whether the difference between expected and actual comparative numbers of each type of dissertation was significant. Kantorski and Stegman (2006) analyzed each dissertation for degree type (EdD, PhD, and DME [Doctor of Music Education]). Although they did not clearly compare quantitative versus qualitative design methods, they did compare qualitative as one group to every design that was not qualitative as another group. This is not quite the same as a quantitative/qualitative comparison because there are other research designs, such as historical study and program evaluation, mentioned by Nelson and Coorough (1994). Kantorski and Stegman (2006) reported their results in tables showing the numbers and percentages of dissertations through the years that reflected the various qualities that they selected to study. Their tables and discussion dealt with trends, but no chi-square tests or other tests of significance were used.

This design methodology is appropriate because content analysis and trend analysis are standard methods of gathering and analyzing data from archived documents (Gall et al., 2007; Neuendorf, 2017) and because it has been used in similar studies published in peer-reviewed journals (Kantorski & Stegman, 2006; Nelson & Coorough, 1994).

Research Questions

The study used the following research questions:

RQ1: Is there a trend in the frequency of EdD dissertations compared to PhD dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017?

RQ2: Is there a trend in the frequency of research methodology choices (quantitative, qualitative, and mixed methods) for dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017?

Null Hypotheses

H₀₁: There is no statistically significant change in the frequency of EdD dissertations compared to PhD dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017.

H₀₂: There is no statistically significant change in the frequency of research methodology choices (quantitative, qualitative, and mixed methods) for dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017.

Participants and Setting

The participants for this study of archived documents were a random sampling of doctoral candidates from the years 2007, 2012, and 2017 whose dissertations were published in the ProQuest online database of dissertations. All information on ProQuest is available as public

record. This database is available among the online research resources of the university hosting this study. According to the description of ProQuest on the hosting university's list of databases, ProQuest is the "most comprehensive collection of dissertations and theses from around the world, spanning from 1743 to the present day and offering full-text for graduate works added since 1997 and selected full-text for works prior to 1997" (Liberty University, n.d., n.p.). The ProQuest (n.d.) website stated the same ideas: its collection of theses and dissertations extends back to 1743, with full texts of documents from 1997 to the present, and selected works published prior to 1997 are also presented in full text. ProQuest Dissertations and Theses Global is an omnibus database comprised of seven subject matter databases for dissertations and theses. The social science database, including education, is one of the seven. The advanced search functions, described in the Procedures section to follow, made this site suitable for selecting all the doctoral dissertations published in the field of education, for the desired specific years, and from the one desired state of focus, Virginia. An advanced search of the hosting university's online databases of peer-reviewed journal articles published from 2012 to 2017 (as of August 2017) showed 162 articles which used ProQuest to identify data for their research. This search excluded doctoral dissertations. Among these articles were 41 articles in the discipline of education (e.g., Allen & Weber, 2016; Funge, Sullivan, & Tarter, 2016; Sparks, 2017).

The years chosen for sampling, 2007, 2012, and 2017, reflected an assumption and a goal of the researcher. The researcher assumed that if there was a trend in doctoral candidates' choices of degree types and methodology types, the five-year intervals would be sufficient to reveal the trend. Recently published works have expressed trends in the area of methodology choice, e.g., Archibald (2016) and Creswell (2015). However, the most recent source which the researcher found to compare doctoral degree choices, Nelson and Coorough's (1994) study,

showed no clear trend as late as 1990. The researcher's goal was to bring these studies up to the present time. A study that extended to the end of 2017 would, by the time of publication, be the most recent evaluation possible.

This sample represented the population of all doctoral candidates in the state of Virginia who had dissertations published in the ProQuest Dissertations and Theses Global database in those years. One hundred thirty dissertations were randomly selected as the samples to represent the population of each year, 2007, 2012, and 2017. The population for each year was all the dissertations published in Virginia institutions of higher education in the given year. The number 130 was chosen because 124 is the minimum sample size required to attain a statistical power of .70 and a medium effect size when using the chi-square test of association (Gall et al., 2007; Warner, 2013). The setting for this study was doctoral-degree-granting universities in the state of Virginia. Searches of the ProQuest Dissertations and Theses Global showed that there were 234 dissertations dealing with education written in Virginia universities in 2007, 305 in 2012, and 285 in 2017.

Some dissertations employed methodologies that could not be classified as quantitative, qualitative, or mixed methods. Although much less common, program evaluations and historical reviews are sometimes used as methodologies (Nelson & Coorough, 1994). These dissertations were passed over, and the next randomly chosen dissertation was evaluated. Similarly, if a degree type was something other than the EdD or PhD, that dissertation was passed over. Kantorski and Stegman (2006) included the Doctor of Music Education Degree as a topic represented in doctoral dissertations in the field of music education, their particular focus. Omitting those allowed this study to more closely follow the pattern of the Nelson and Coorough's (1994) study, and one purpose of this study was to bring two elements of the Nelson

and Coorough study—the EdD/PhD choice and the quantitative/qualitative choice—up to the present time.

The sample size was 130 dissertations from each of the three years under consideration. According to Gall et al. (2007), 124 is the number of data points required for a statistical power of .70 at the .05 alpha level with a chi-square analysis in a 3 x 4 design (see Tables 5 and 6).

Table 5

Frequencies of Degree Types in All Years of the Study

	2007	2012	2017
Degree	Number of Cases		
PhD	90	81	67
EdD	40	49	63

Notes. PhD = Doctor of Philosophy Degree,
EdD = Doctor of Education Degree.

Table 6

Frequencies of Methodology Types in All Years of the Study

	2007	2012	2017
Method	Number of Cases		
Quant	57	60	59
Qual	44	43	60
Mixed	29	27	11

Notes. Quant = quantitative, Qual = qualitative,
Mixed = mixed methods.

Procedures

Initial steps involved obtaining a letter of approval (see Appendix A) from the host university's institutional review board (IRB) and selection of a random sample of dissertations.

After approval of the research plan, the researcher identified all doctoral dissertations written by doctoral candidates in the years 2007, 2012, and 2017 for the discipline of education in the state of Virginia. The unit of statistical analysis was the individual dissertation. The choice of years is itself a sampling procedure. The choice reflected the intention to sample dissertations at five-year intervals, allowing time for any trends to manifest themselves. It also reflected the intention to bring the study up to the most current, completed year as of the publication of the research, which was 2018. To identify the appropriate dissertations, the researcher accessed the ProQuest database and used the advanced search function. The search terms and filters were as follows:

(1) In the first search term box, enter “Virginia,” and in the filter box to the right, where the word “Anywhere” was the default, click for the drop-down menu and choose the filter “University/Institution Location – ULO.” (2) In the second search term box, at the left where the Boolean search function “AND” showed, click for the drop-down menu and choose “NOT” and enter “West Virginia.” This limited the search to dissertations from institutions in Virginia. (3) Below the search term boxes, the box was checked for “Limit to ... Full text.” (3) At the “Publication date” filter, the drop-down menu was clicked and the choice “Within this year” was made and the desired year (e.g., 2007) was typed into the box below. (4) At the filter “Subject heading (all),” “education” was typed. (5) At the filter “Manuscript type,” the box for “Doctoral dissertations” was checked. (6) Then the “Search” button was clicked. For the year 2007, this search reported that 234 dissertations were found.

After identifying the whole population of appropriate dissertations in each year, 130 samples were selected at random from among the year’s population. The researcher used an online program to generate random numbers (Random.org, 2017). The researcher generated a set of 150 random numbers from the range of numbers 1 through the total number of possible

dissertations for a given year. For 2007, when there were 234 dissertations appropriate for this study, this random-number generation yielded a selection of 150 numbers from the range of 1 through 234. The random number generator returned the numbers ordered from low to high. This order facilitated finding the randomly selected items in list of dissertations produced by the search of the ProQuest database. One hundred fifty dissertations were sampled, even though the target number of dissertations to analyze is 130. This allowed for the event that some could not be used in the study because the degree or methodology type could not be clearly determined or was outside the goals of this study. ProQuest returned documents in a numbered list. The dissertations in the ProQuest list having numbers which matched the randomly chosen numbers were copied into an Excel spreadsheet. These were the samples chosen for a given year. The Excel spreadsheet program has a feature that highlights repeat values. This feature was enabled. Occasionally a dissertation appeared more than once in the ProQuest database.

After the random selection process, the sampled dissertations were analyzed for degree and methodology types. First, the researcher identified the degree type which was sought by the writer of the dissertation. Systematic identification of the degree types was very clear. The title pages of the dissertations contained the degree type in a phrase similar to *in partial fulfillment of the requirements for the degree of Doctor of Education/Doctor of Philosophy*.

After that, the researcher identified the methodology employed. Systematic identification of the methodology—quantitative, qualitative, or mixed methods—proved more demanding than the identification of the degree type. Sometimes the methodology type was identified in the title, such as *Estimating Statewide Achievement Gap Effects Using Hierarchical Linear Models: Applications for No Child Left Behind Data* (Tuerk, 2007). Hierarchical linear modeling is identified by Gall et al. (2007) as a statistical method. Sometimes the methodology was

identified by the author in the abstract. For instance, Lucas (2007) stated this in the abstract: “The study used a qualitative method to accomplish this task” (p. 5). Regarding the use of abstracts for content analysis, Nelson and Coorough (1994) stated that there is “near-perfect agreement between content analysis of dissertation abstracts and analysis of the total studies” (p. 160). In all cases of this study, at least the title and the abstract were both analyzed for methodology type. However, it sometimes was necessary to study the methodology section to draw conclusions about the research design. For instance, in *How Exemplary Teachers Educate Children of Poverty, Having Low School Readiness Skills, Without Referrals to Special Education* (Howard, 2007), the title and the abstract were not sufficient to determine whether the study was quantitative, qualitative, or mixed methods. The methodology section clarified the matter by describing the data collection methods as the conducting of interviews, creation of video and audio recordings, and the writing of memos. This dissertation was classified as qualitative in methodology. In the title and in the abstract, the researcher looked for the words *quantitative, qualitative, or mixed methods*. These locations sometimes included reference to one or more specific types of methodologies within the quantitative or qualitative domain or both domains. This research combined and followed the paradigms of Creswell (2015) and Gall et al. (2007) for identifying methodologies by the mention of the research designs employed. Both were needed because each mentioned something the other passed over. Quantitative methodologies were considered to include experimental, quasi-experimental, correlational, survey, descriptive, and causal-comparative research. Qualitative methodologies were considered to include grounded theory, ethnography, narrative, case study, and historical research. Although Creswell (2015) included action research in the qualitative area, Gall et al. (2007) placed both action research and evaluative research in the category “applications of

research” (p. vi), as distinct from quantitative or qualitative “approaches to research” (pp. v-vi). This study followed the evaluation of Gall et al. and omitted from the data any dissertations labeled as action research or evaluative research. The term “applied research design” (Baird 2007, p. 7) was used in some studies, with further delimitation of the methodology as qualitative. These studies were included in this research. Mixed methods research included types labeled mixed methods research (or similar titles) and studies that identified specific research types from each of the two broad domains as having been used in the same study. With or without such a statement in the title, the researcher evaluated each dissertation’s abstract, looking for the same terms. If a determination could not be made on the basis of the title and abstract, the researcher examined the methodology chapter (or area) of the dissertation for those key words or descriptions of research methods that identified the research type. If the design type was still not clear, the researcher examined the Data Analysis section for indications. The naming of statistical tests, like the *t*-test, ANOVA, or chi-square was taken to indicate quantitative methodology. Mention of seeking themes among written or recorded words, formation of codes and categories of data (not dummy coding, such as 0 = female and 1 = male) was taken to indicate qualitative research (Creswell, 2013). A combination of terms from the two broad domains was interpreted as indicating mixed methods.

Some dissertations selected by the random number process were not usable for this study because they named a degree other than the EdD and PhD. Others were not usable because the research methodology could not be clearly identified as quantitative, qualitative, or mixed methods after examination of the title, abstract, and methods sections. Such dissertations were omitted from the study and the dissertation identified by the next random number was examined.

Then, for each randomly selected sample dissertation, data was recorded in an Excel spreadsheet. The headings on the spreadsheet included the following: year of publication, title, author, ProQuest number, degree type (1 = EdD, 2 = PhD), and methodology (1 = quantitative, 2 = qualitative, 3 = mixed methods).

Data Analysis

Data Screening

IBM SPSS ® version 25 software was used to analyze the data. The independent variable in this study was the year of dissertation publication. The dependent variables in this study were (1) the type of degree sought (PhD, coded 1; and the EdD, coded 2) and (2) the research methodology chosen (quantitative, coded 1; qualitative, coded 2; and mixed methods, coded 3). Descriptive statistics for the research variables were generated in the form of frequency counts for each of the three years of consideration. Warner (2013) stated that frequency counts are useful for gathering data for statements of proportions and percentages. Data was screened for impossible or extreme numbers by a visual analysis of the SPSS tables of individual entries (each dissertation) and the totals for each category, each year.

Variables

The two statistical tests that were used, chi-square and Cramér's *V*, allowed freedom in the choice of which variable was considered the independent (predictor) variable and which was the dependent (criterion) variable. According to Warner (2013) Cramér's *V* is a symmetrical comparison, that is, "it does not matter which is the independent variable" (p. 334). Warner (2013) also stated that a large chi-square statistic could show merely a "relationship between group membership on the two variables" (p. 1075) and indicate the "strength of association" (p. 318) between the variables, but no mention of causality was made in either of these

discussions. Since Warner (2013) stated that the dependent variables in nonparametric tests may be “either nominal or ordinal” (p. 22), the year of dissertation publication (2007, 2012, and 2017) was assigned the title of independent variable. The two degree-type choices (EdD and PhD), which are nominal variables, were designated as the dependent variables for the first research question. The three choices for research methodology (qualitative, quantitative, and mixed methods), which are also nominal variables, were the dependent variables for the second research question.

Assumption Testing

According to Green and Salkind (2014), the chi-square is a nonparametric test. Therefore, normal distribution of scores is not a requirement. Categorical or nominal data, which do not have interval or ratio numeric expression, are acceptable. According to Green and Salkind (2014), two assumptions are required. The first has two parts: randomness of sampling and independence of observations. The random sampling was an important part of this research design, accomplished by the generation of random numbers and the use of those numbers in the choice of dissertations for the study from the list generated by the ProQuest search. The requirement of independence of observations was also met. This is indicated by the fact that no selected dissertation could affect the data yielded by another selected dissertation. The second required assumption is a “relatively large” sample size (Green & Salkind, 2014, p. 321). Green and Salkind (2014) suggested that not more than 20% of the cells should have frequencies of less than five. Considering the 124 cases each year required to achieve a statistical power of .70 at the $\alpha = .05$ level, this was not a problem. One hundred and thirty dissertations were selected for each year, further assuring that the requirement of a large sampling of cases was met.

Analysis and Reporting

The frequency counts were converted into percentages in the SPSS analysis. This eliminated the effect of the variability of the numeric totals from year to year and allowed the analysis to be based on ratios, that is, on having the same comparison base of 100% each year.

The chi-square statistic was derived using SPSS software. The chi-square is a test for the statistical significance of changes (Gall et al., 2007). That answered the question of whether the changes in percentages of degree choices and methodology choices over the years of the study were statistically significant. Each year studied (2007, 2012, and 2017) provided analysis of two options for the degree choice (EdD or PhD) and three options for the methodology choice (qualitative, quantitative, or mixed methods). The total counts were gathered into two data tables, one for tracking changes in the degree choice and the other for tracking changes in the methodology choice (see Table 5 and Table 6). This analysis and these tables reflect the two research questions. For each research question, a chi-square analysis was used to test whether changes in percentages were statistically significant. According to Neuendorf (2017), the chi-square is “a statistic designed for assessing the interrelationship between ... nominal variables” (p. 255). The choices considered for each dissertation were nominal variables. Gall et al. (2007) also showed the chi-square used with 2 x 4 and 3 x 4 tables, suggesting that the 2 x 3 and 3 x 3 tables were within the range of usage. Green and Salkind (2014) stated that “if the chi-square test (Pearson or likelihood ratio) has more than one degree of freedom, it is an omnibus test,” (p. 334) and the components can be individually tested for significance in the follow-up testing. This was useful for testing whether there was significant change at one five-year stage, but not at the other. For example, the change in percentage of EdD and PhD Degrees could have been significant from 2007 to 2012, but not from 2012 to 2017.

According to Gall et al. (2007), the chi-square test is “a nonparametric test of statistical significance that is used when the research data are in the form of frequency counts for two or more categories” (p. 634). That description fits the data arrangement (see Tables 5 and 6). Creswell (2015) stated that the chi-square test is useful for studies comparing categories within groups. Hashemi and Babaii (2013) used the chi-square analysis in a trend study of mixed-methods research in linguistics from 1995 to 2008, a study that is similar to this research because, in this study, categories such as degree types or methodology types were grouped by the years of dissertation publication. Creswell (2015) further stated that the chi-square requires one independent and one dependent variable. For this study, either the year of publication or the choice-type (degree or methodology) could be called the independent or dependent variable with no difference (Warner, 2013). All that was sought was whether there was a trend that was statistically significant at the alpha-level .05. The information sought was whether the change in numbers of EdD degrees versus PhD degrees, for example, from one year to the next was enough to be significant beyond the level of chance variations. The dependent/independent variable designation was arbitrary because there was no intention to imply causation. This study had two chi-square analyses, one with three years of dissertation data in two categories (the EdD or PhD choice) and another with the same three years of data, analyzing the same dissertations in regard to the other factor considered in each dissertation, the three categories of methodology (quantitative, qualitative, or mixed methods). Creswell (2015) further stated that the chi-square test is used for categorical data, such as the variables in this study. Finally, Creswell (2015) stated the chi-square test could be used with non-normal distributions of data, a condition to be expected when there are so few summarized data points, as indicated by the 3 x 2 and 3 x 3 tables.

The chi-square yields a p value, allowing a statement about statistical significance. Gall et al. (2007) specified a minimum sample size of 124 to be likely to yield a statement of statistical significance at the $\alpha = .05$ level, a medium effect size, and a statistical power of .70. Higher statistical powers indicate a data set with a “better chance of obtaining a statistically significant outcome” (Warner, 2013, p 23).

Data was analyzed for effect size by crosstabulation. Crosstabulation performed by SPSS software on a two-way contingency table yields several measures of effect size, but Green and Salkind (2014) focused on Pearson’s r and Cramér’s V . “For 2 x 2, 2 x 3, and 3 x 2 tables, phi and Cramér’s V are identical” (p. 331). This condition described the 2 x 3 table tracking the changes of EdD and PhD degrees through 2007, 2012, and 2017. However, the data for the methodology choice was recorded in a 3 x 3 table. Green and Salkind (2014) stated that “if both the row and the column variables have more than two levels, phi can exceed 1 and, therefore, be hard to interpret” (p. 331). Since, according to Warner (2013), Cramér’s V is the “most widely reported effect size for the chi-square test of association” (p. 334), Cramér’s V was used to report effect size for both the degree-type choice and the methodology-type choice. Further, Warner (2013) stated that Cramer’s V was a symmetrical measure of association: it does not matter which nominal category is labeled as the independent variable and which is labeled as dependent. Since no cause-effect relationship is intended, that flexibility fit this study. Finally, the analyzed data was presented as frequency tables and graphs.

Summary

In Chapter Three the design of the study was discussed: content analysis seeking data, followed by trend analysis of that data. The research questions and null hypotheses were presented. The participants and setting providing the 130 dissertations per year were explained.

The instrumentation, ProQuest Dissertations and Theses Global, was described, and the methods for sampling dissertations and recording data were presented. Finally, the data analysis procedures, including the chi-square analysis of significance and Cramer's V for effect size were explained.

CHAPTER FOUR: FINDINGS

Overview

Chapter Four presents the descriptive statistics regarding the choices that doctoral candidates have made between degree types (the Doctor of Education Degree, the EdD; and the Doctor of Philosophy Degree, the PhD) and among research methodologies (quantitative, qualitative, or mixed methods). It reviews the data screening procedures and the assumptions required for chi-square analysis. The chapter also presents the statistical analyses of the data. The results for the trend analyses, with their chi-square, Cramér's V , and phi statistics, are presented for the 11-year span of the study (2007, 2012, and 2017), treating the years of dissertation publication as the independent variables and treating the choice of degree type and methodology type as the dependent variables.

Research Questions

RQ1: Is there a trend in the frequency of EdD dissertations compared to PhD dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017?

RQ2: Is there a trend in the frequency of research methodology choices (quantitative, qualitative, and mixed methods) for dissertations written in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017?

Null Hypotheses

H₀1: There is no statistically significant change in the frequency of EdD dissertations compared to PhD dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017.

H₀2: There is no statistically significant change in the frequency of research methodology

choices (quantitative, qualitative, and mixed methods) for dissertations published in the field of education in the state of Virginia, comparing the years 2007, 2012, and 2017.

Descriptive Statistics

Data were grouped for analysis by the independent variables, the years of dissertation publication. The results for the degree choice can be viewed in Table 5. Random sampling among education doctorates earned in the state of Virginia yielded 152 EdD Degrees and 238 PhD Degrees for the three years of the study. In the sample taken for 2007, 40 EdD Degrees and 90 PhD Degrees were earned. In the sample taken for 2012, 49 EdD Degrees and 81 PhD Degrees were earned. In the sample taken for 2017, 63 EdD Degrees and 67 PhD Degrees were earned (see Table 7). The average length of the dissertations sampled from EdD degree candidates for all three years was 168 pages, and the average length of dissertations sampled from PhD candidates was 194 pages. Arranged by methodology for the three years of the study, the average page counts were as follows: quantitative dissertations, 156 pages; qualitative dissertations, 207 pages; and mixed-methods dissertations, 207 pages.

Table 7

Frequencies of Degree Types in All Years of the Study, Ordered for SPSS

Independent Variable	PhD (<i>n</i> = 238)	EdD (<i>n</i> = 152)
2007	90	40
2012	81	49
2017	67	63

Notes. EdD = Doctor of Education Degree, PhD = Doctor of Philosophy Degree.

Data were also analyzed for the choices of research methodology made by doctoral candidates for the same years. The results for the research methodology are presented in Table 8.

Of the selected dissertations in 2007, 57 were written using quantitative methodology, 44 were written using qualitative methodology, and 29 were written using mixed-methods methodology. In 2012, 60 were written using quantitative methodology, 43 were written using qualitative methodology, and 27 were written using mixed-methods methodology. In 2017, 59 were written using quantitative methodology, 60 were written using qualitative methodology, and 11 were written using mixed-methods methodology.

Table 8

Frequencies of Methodologies in All Years of the Study, Ordered for SPSS

Independent Variable	Quant (<i>n</i> = 176)	Qual (<i>n</i> = 147)	Mixed Mthd (<i>n</i> = 67)
2007	57	44	29
2012	60	43	27
2017	59	60	11

Notes. Quant = quantitative research, Qual = qualitative research, Mixed Methd = mixed-methods research.

Results

Data Screening

The researcher conducted data screening by a visual scan in the SPSS data files, which were sorted for each of the dependent variables (methodology type: quantitative, qualitative, or mixed methods; and degree type: PhD or EdD). These variables were coded as follows: PhD = 1, EdD = 2; quantitative = 1, qualitative = 2, mixed methods = 3. No impossible or missing values were found. Total numbers of dissertations were crosschecked between totals by year, totals by degree, and totals by methodology. The same total number of dissertations was found in each case, 390. Errors of incomplete data were precluded by the research design: If one of

the three variables for the study (year, degree, or methodology) was not discernable, that dissertation was passed over, and the next randomly sampled dissertation was analyzed.

Assumptions

According to Green and Salkind (2014), two assumptions must be met for calculation of a chi-square statistic. The first assumption is random sampling with independence of observations. Randomness of sampling was assured by the use of computer-generated random numbers to select dissertations from the list of dissertations that fit this study's design, as generated by ProQuest Dissertations & Theses Global database (ProQuest). The independence of observation is assured by the unlikelihood that any one person's decisions about graduate degree and research methodology would influence the decision of anyone else in this study. The second assumption is a "relatively large" number of cases in the study (Green & Salkind, 2014, p. 321). That loosely defined goal is given some specific form with Green and Salkind's (2014) statement that none of the cells in the data table should have fewer than five cases. In this study, the lowest number of cases in any one cell was 11. The goal of having a statistical power of .70 and a medium effect size dictated that at least 124 dissertations per year should be included (Gall et al., 2007). This study sampled 130 dissertations per year. These numbers further assured meeting the assumption of a large number of data points.

Results for Null Hypothesis One

A crosstabulation analysis was used to test the relationship between the independent variables (years of dissertation publication) and the dependent variables (degree types) at a 95% confidence level. The years of dissertation publication were entered as interval levels of measurement: 2007, 2012, and 2017. The categorical variables were dummy-coded. Degree type was coded "1" for PhD and "2" for EdD.

The crosstabulation showed the frequency and percentages of the different doctoral degrees in the three years selected for the study (see Table 9).

Table 9

Crosstabulation for Degree Types in All Years of the Study

Year		Degree		Total
		1	2	
2007	Count	90	40	130
	Expected	79.3	50.7	130.0
	Count			
	% within Year	69.2%	30.8%	100.0%
2012	Count	81	49	130
	Expected	79.3	50.7	130.0
	Count			
	% within Year	62.3%	37.7%	100.0%
2017	Count	67	63	130
	Expected	79.3	50.7	130.0
	Count			
	% within Year	51.5%	48.5%	100.0%
Total	Count	238	152	390
	Expected	238.0	152.0	390.0
	Count			
	% within Year	61.0%	39.0%	100.0%

Notes. 1 = Doctor of Philosophy Degree, 2 = Doctor of Education Degree.

The results of the crosstabulation analysis that included all three selected years (2007, 2012, and 2017) were statistically significant at the $\alpha = .05$ level: $\chi^2(2) = 8.689$, $p = .013$. According to Warner (2013), “a large chi-square statistic [χ^2] indicates that there is a relationship between group membership of the two variables” (p. 1075). According to Warner (2013), the critical value for the chi-square statistic with two degrees of freedom at the 95% confidence level is 5.99 (see Table 8). The chi-square $\chi^2(2) = 8.689$ indicates that there is probably a relationship

between the year of dissertation publication and the choice of degree made by the doctoral candidates of that year (see Table 10). Therefore, the researcher rejected Null Hypothesis One.

Table 10

Chi-square Tests for Degree Types in All Years of the Study

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.689 ^a	2	.013
Likelihood Ratio	8.696	2	.013
Linear-by-Linear Association	8.532	1	.003
N of Valid Cases	390		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 50.67.

The effect size is “an index of the strength of association between two variables” (Warner, 2013, p. 1084). Cramér’s V is “the most widely reported effect size for the chi-square test of association” (Warner, 2013, p. 334). Cramér’s V for the trend study of degree choices for the entire span of the three sampled years is .149 with a statistical significance of $p = .013$ (see Table 11). This indicates that the trend is highly probable to be real, not a sampling error, because $p < .05$. However, since the Cramér’s $V = .149$, the effect size is between “small” and “medium” in a table for Cramér’s V with 2 degrees of freedom, where .07 is small and .21 is medium (Zaiontz, n.d., n.p.). That is, the year of publication is likely to predict a difference in the doctoral degree choice in the sampled population, but the year of publication is not a very strong indicator of that “group membership” (Warner, 2013, p. 1075).

Table 11

Symmetric Measures for Degree Types in All Years of the Study

		Value	Approximate Significance
Nominal by Nominal	Phi	.149	.013
	Cramer's V	.149	.013
N of Valid Cases		390	

Results for Null Hypothesis Two

The relationship between the years of dissertation publication (independent variable) and the methodology choice made by doctoral candidates (dependent variable) was analyzed at the 95% confidence level by crosstabulation. The years of dissertation publication were 2007, 2012, and 2017. These were entered as interval data. The methodology choices, which were categorical variables, were dummy-coded. Quantitative research methodology was coded "1." Qualitative methodology was coded "2." Mixed-methods methodology was coded "3."

The crosstabulation showed the frequency and percentages of the methodology choices in the three years selected for the study (see Table 12).

Table 12

Crosstabulation for Methodology Choices in All Years of the Study

			Method			
			1	2	3	Total
Year	2007	Count	57	44	29	130
		Expected	58.7	49.0	22.3	130.0
		Count				
		% within Year	43.8%	33.8%	22.3%	100.0%
	2012	Count	60	43	27	130
		Expected	58.7	49.0	22.3	130.0
		Count				
		% within Year	46.2%	33.1%	20.8%	100.0%
	2017	Count	59	60	11	130
		Expected	58.7	49.0	22.3	130.0
		Count				
		% within Year	45.4%	46.2%	8.5%	100.0%
Total	Count	176	147	67	390	
	Expected	176.0	147.0	67.0	390.0	
	Count					
	% within Year	45.1%	37.7%	17.2%	100.0%	

Notes. For Method, 1 = Quantitative methodology, 2 = Qualitative methodology, 3 = Mixed-methods methodology.

The results of the crosstabulation chi-square analysis that included all three selected years (2007, 2012, and 2017) were statistically significant at the $\alpha = .05$ level: $\chi^2(4) = 12.510$, $p = .014$ (see Table 13). According to Warner (2013), the critical value for the chi-square statistic with four degrees of freedom at the 95% confidence level is 9.49. The p -value was .014, below the $\alpha = .05$ level. Similar to the analysis of degree-type trends, the analysis of methodology trends yielded Cramér's V value of .127, $p = .014$ (see Table 14). This is an effect size between "small" and "medium" (Zaiontz, n.d., n.d.). Again, a significant trend is indicated, this time in the methodology choices (quantitative, qualitative, or mixed methods) made by doctoral candidates

whose dissertations were published during the years 2007, 2012, and 2017. Therefore, the researcher rejected Null Hypothesis Two.

Table 13

Chi-Square Tests for Methodology Choices in All Years of the Study

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.510 ^a	4	.014
Likelihood Ratio	13.495	4	.009
Linear-by-Linear Association	2.816	1	.093
N of Valid Cases	390		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.33.

Table 14

Symmetric Measures for Methodology Choices in All Years of the Study

		Value	Approximate Significance
Nominal by Nominal	Phi	.179	.014
	Cramer's V	.127	.014
N of Valid Cases		390	

Follow-up tests were conducted upon the year-methodology crosstabulation. The researcher had seen references in the literature review to a trend toward mixed-methods research (Alasuutari, 2010; Archibald, 2016; Thaler, 2017), although no statistical evidence was offered in those sources. However, the researcher noticed in the crosstabulation table (Table 10), a decreasing percentage of dissertations being written with mixed-methods methodology in the years of this study: 2007, 22.3%; 2012, 20.8%; 2017, 8.5%. Therefore, the researcher conducted pairwise comparisons of the three years of study.

The variations seen among the three methodology scores between 2007 and 2012 yielded a chi-square statistic of $\chi^2(2) = .160$ with a significance of $p = .923$. The chi-square is below the critical value of 5.99 (Warner, 2013) and the p -value is above the $p < .05$ level. These data indicate no significant difference in methodology choices between the years 2007 and 2012 (see Tables 15 and 16).

Table 15

Chi-square Tests for Pairwise Comparison of Methodology Types, 2007 and 2012

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.160 ^a	2	.923
Likelihood Ratio	.160	2	.923
Linear-by-Linear Association	.157	1	.692
N of Valid Cases	260		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 28.00.

Table 16

Symmetric Measures for Pairwise Comparison of Methodology Types, 2007 and 2012

		Value	Approximate Significance
Nominal by Nominal	Phi	.025	.923
	Cramer's V	.025	.923
N of Valid Cases		260	

The pairwise comparison of dissertation methodologies for 2012 and 2017 presented a different pattern from the pairwise comparison of 2007 and 2012. The chi-square statistic was $\chi^2(2) = 9.551$, where 5.99 is the critical value (Warner, 2013). The p -value is .008. These statistics suggest that a significant relationship exists between a dissertation from this sample

population having been written in 2012 or 2017 and the methodology that the writer chose (see Tables 17 and 18).

Table 17

Chi-square Tests for Pairwise Comparison of Methodology Types, 2012 and 2017

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	9.551 ^a	2	.008
Likelihood Ratio	9.779	2	.008
Linear-by-Linear Association	1.701	1	.192
N of Valid Cases	260		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 19.00.

Table 18

Symmetric Measures for Pairwise Comparison of Methodology Types, 2012 and 2017

		Value	Approximate Significance
Nominal by Nominal	Phi	.192	.008
	Cramer's V	.192	.008
N of Valid Cases		260	

Summary

Chapter Four summarized the data collected, the procedures followed in data screening, the descriptive statistics, and the testing of assumptions required for chi-square analysis. The independent variables were the years of dissertation publication, and the dependent variables were the choices made by Virginia education doctoral candidates in two areas: degree type sought and methodology type employed. The SPSS analysis revealed that there are statistically significant relationships between year of publication and both the degree choice and the

methodology choice. The researcher rejected both null hypotheses. Chapter Five will discuss these statistical findings in context of the literature review and the population sampled. It will also discuss the implications of these findings.

CHAPTER FIVE: CONCLUSIONS

Overview

Chapter Five will discuss the results of the statistical analysis and the implications of those results considering related research and considering the population that was studied. In addition, limitations of the study will be examined and recommendations for future research will be presented.

Discussion

The purpose of this quantitative, archival, content analysis study of dissertations written in the field of education was to provide a current view of trends in doctoral dissertations in the state of Virginia on two variables: the type of degree being pursued, the Doctor of Education Degree (EdD) or the Doctor of Philosophy Degree (PhD), and the kind of methodology being used, quantitative, qualitative, or mixed methods. The independent variable is *year of dissertation publication* (2007, 2012, or 2017). The *year of dissertation publication* is defined as the year under which a dissertation was listed in ProQuest Dissertations and Theses Global database (ProQuest), using the search filter “Publication date” (ProQuest, n.d., n.p.). The dependent variable for the first research question was the choice of degree-type, EdD or PhD. The *Doctor of Education Degree* is defined as the degree awarded in a program designed to develop “scholar practitioners” (Boyce 2012, p. 24) who will focus on applying research to effect change in society (Amrein-Beardsley et al., 2012; Boyce, 2012). The *Doctor of Philosophy Degree* is defined as the degree awarded in a program designed to develop scholar researchers who will focus on developing and assessing theory in particular fields of study (Amrein-Beardsley et al., 2012; Boyce, 2012). The dependent variable for the second research question was the methodology choice (quantitative, qualitative, or mixed-methods). *Quantitative*

methodology is defined as a research design that assumes that human interactions are manifested by objectively observable phenomena and that these phenomena are relatively stable across a range of social groups or times. It records data that can be expressed in numbers and analyzes that data by statistics (Creswell, 2013). *Qualitative methodology* is defined as a research design that is based on the belief that people develop their own unique ideas of reality, and that these conceptions of reality vary among social groups and across the range of times. It employs extensive observation of individuals or groups, or reviews artifacts, seeking to understand the “lived experiences” (Creswell, 2013, p. 76) of an individual or group. It does not seek to provide findings that are generalizable beyond the individual or group being studied (Creswell, 2013). *Mixed-methods methodology* is defined as a research design that employs both quantitative and qualitative techniques in the same study (Creswell, 2013). This combination is manifested in new patterns distinct from both quantitative and qualitative research in their methods, their research designs, and their ways of coding and processing data (Creswell, 2015).

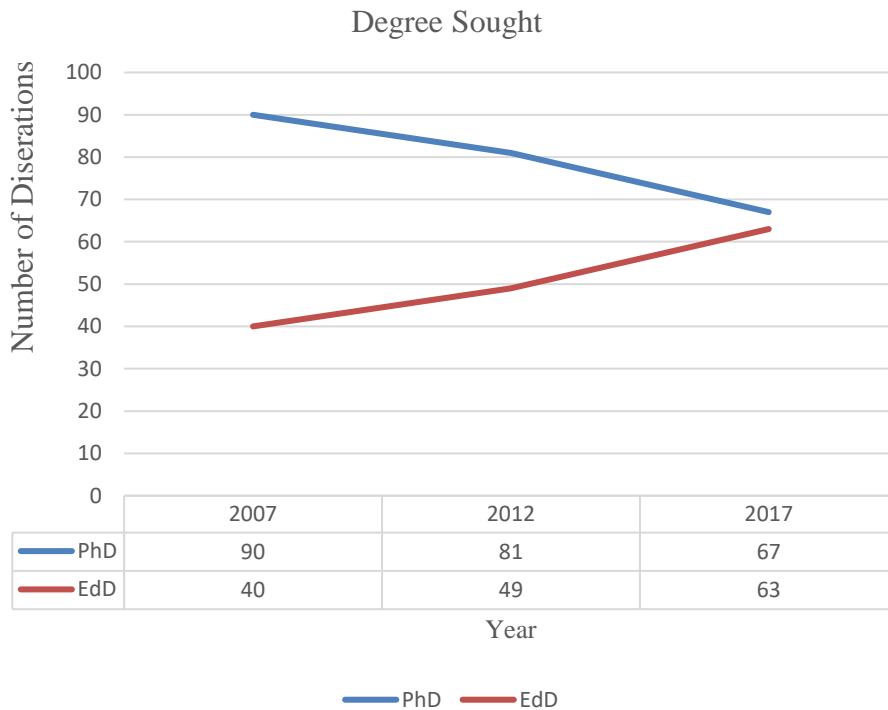
Year of Publication and Degree Choice

Although the doctoral degree has existed since the European medieval era (Noble, 1994) with changing significance (Noble, 1994; Park, 2005), the EdD and the PhD have coexisted in context of university programs requiring the modern version of the dissertation only since the 1920s (Nelson & Coorough, 1994). That fact makes the seminal study of degree trends by Nelson and Coorough (1994) a timely work. Sampling from doctoral degrees written anywhere in the United States in the years from 1950 to 1990 at 10-year intervals, they showed no trend (see Table 1). None of the literature reviewed for this study mentioned a trend difference between the EdD and the PhD. However, the results of this research showed a statistically significant trend, with the EdD becoming more represented in the time span from 2007 to 2017

(see Table 8 and Figure 1). The explanation for the divergence of this study from the research literature may be in two other factors which the researcher noticed while analyzing the randomly selected dissertations. First, an increasing number of selected dissertations were from one university, here called University A. Second, all the doctoral degrees in the field of education at University A were EdDs. There were no PhDs in education from University A. Yet, University A was producing a growing percentage of the doctoral degrees in Virginia in the field of education during the years of the study (see Figure 2). The Nelson and Coorough (1994) study was national, but the population for this study was just the state of Virginia. The fact that the sample population for this study was the state of Virginia in a time span when University A was rapidly growing in the number of doctoral degrees granted may have skewed this study.

Figure 1

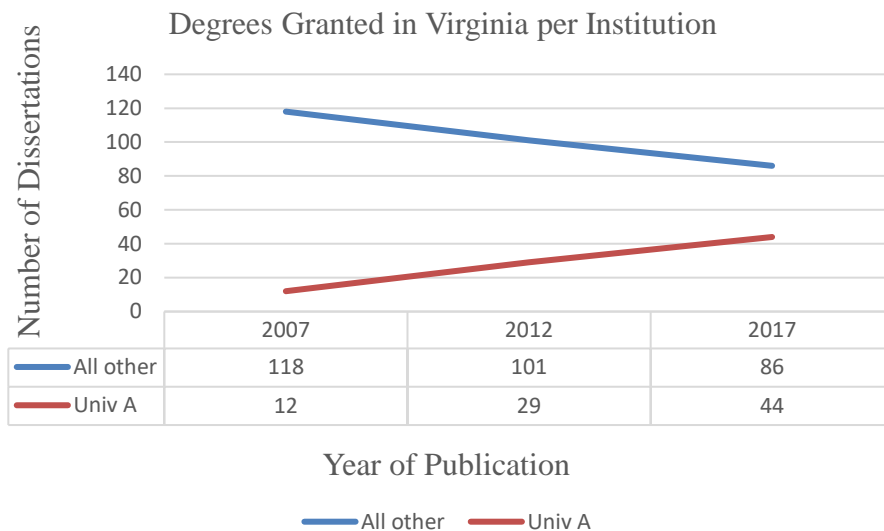
Doctoral Degrees Granted in the Virginia Sample Population by Year and Degree Type



Notes. PhD = Doctor of Philosophy Degree, EdD = Doctor of Education Degree.

Figure 2

Doctoral Degrees Granted in the Virginia Sample Population by Year and Degree-granting Institution

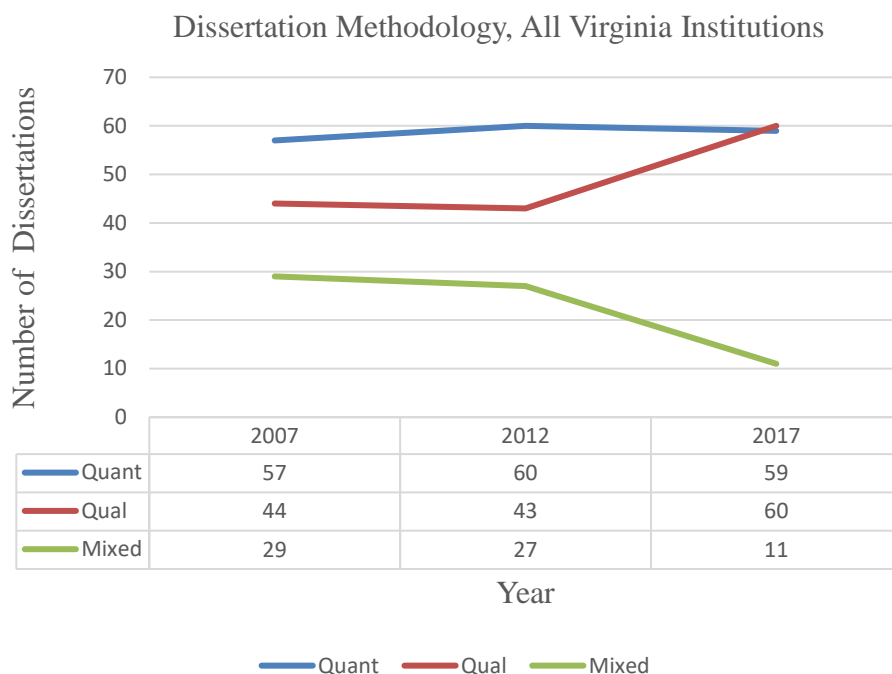


Notes. All Other = all doctoral-degree granting institutions in this study other than University A; Univ A = University A (pseudonym).

Year of Publication and Methodology Choice

Research literature commonly mentioned the rise of both qualitative research (Alasuutari, 2010; Canagaraja, 2016) and mixed-methods research (Alasuutari, 2010; Thaler, 2017) since the 1980s. The data of this study provided quantitative evidence for the rise of qualitative research during the period from 2007 through 2017 in the field of education, as reflected by doctoral dissertations written in the state of Virginia (see Figure 3).

Figure 3

Dissertation Methodology in Virginia Sample Population by Year, All Institutions

Note. Quant = quantitative research, Qual = qualitative research, Mixed Methd = mixed-methods research.

However, the downward trend in mixed-methods research in this study contradicted the literature. The explanation may again be in the increasing numbers of dissertations being written under the guidance of University A (see Figure 2). Dissertations that were written for education degrees at University A and that were randomly sampled for this study rarely employed mixed-methods methodology. The researcher categorized the methodologies employed in the dissertations that were sampled from the three years of the study for University A as follows: 55 quantitative, 12 qualitative, and 3 mixed methods. The downward trend in mixed-methods research found in this study may reflect the limitations of the sample, both in location and in time, not a global trend.

Limitations

This research must be understood in terms of the research setting, both time and place. This study measures trends in the frequencies of degree and methodology choices in one population, education doctoral candidates; in one state, Virginia; and in one period of time, 2007-2017. Beyond those qualifiers, threats to external validity must be recognized. External validity is the degree to which the conclusions of research may be generalized from the sample population to a broader population (Trochim, 2006). Although the statistical findings for the described population in the state of Virginia in the given time frame contradicted the null hypotheses, these findings should not be construed as reflecting national or international trends. The degree to which they may predict trends in the prescribed population (education doctoral candidates in the state of Virginia) beyond the stated time frame depends on the persistence of the factors which have influenced this study. Those factors and the possibility of their persistence have not been part of this study.

Another threat to the validity of the study is that one researcher made all the categorization decisions. Most of these decisions were very clear. The degree type, EdD or PhD, was always stated in the dissertation title. The methodology choice was usually clear. Even if was stated in the title, it was crosschecked in the abstract. If these locations did not clearly identify the method, it was further checked by evaluation of the methods section. Still, the researcher could miss details. For instance, one study dealing with attitudes and perceptions and having a strong quantitative element in the methods section, referred to the candidate having made a “preliminary qualitative study” (Zhang, 2007, p. 68). However, close reading confirmed that the preliminary study was not part of the current doctoral dissertation. That dissertation was categorized as quantitative.

Construct validity is also a consideration. Construct validity reflects the degree of relationship between the phenomenon being studied and the theoretical framework to which the researcher relates that phenomenon (Trochim, 2006). This study was conducted with reference to requisite decision modeling (Phillips, 1984; Clemen, 2001). Although the chi-square statistics expressed degrees of correlation between years of dissertation publishing and the choices that doctoral candidates made about degree and methodology types, no causation was intended.

Implications

Empirical Implications

The empirical implications of this research relate to the population that was sampled. Considering the divergence from other research studying national and international trends, the results should be taken as reflecting a reality in education doctoral programs in the state of Virginia in the years 2007, 2012, and 2017. However, the data did reveal findings within this population that were new to the research literature. Whatever causation may exist, the facts are that more qualitative and fewer mixed-methods dissertations were written in the time of the study. This study also showed a statistically significant rise in EdD Degrees in this population, a factor not presented by other studies.

Theoretical Implications

Requisite decision modeling. Two theoretical implications derive from this research. The first relates to requisite decision modeling, the theoretical framework in which this study is positioned. This decision-making model was propounded by Phillips (1984) and advanced by the work of Clemen and others (Clemen, 2001; Clemen, & Reilly, 2013; Clemen & Ulu, 2008). It informs decision making by reducing the many factors that could influence a decision to a short list of the indispensable (requisite) factors and then assigning to each factor a pair of

quantitative values representing the perceived benefit and the perceived cost (not necessarily financial) of each factor being considered (Phillips, 1984). This study indicated that there were statistically significant relationships between a historical setting—the years of dissertation publication and factors happening in the state of Virginia—and the decisions that doctoral candidates made. This study, therefore, pointed to the importance of place and time as parts of requisite decision modeling. This study can also remind students and their mentors of another key element of requisition decision modeling and of biblical decision making: the importance of a “multitude of counselors” (Proverbs 15:22, KJV). A basic feature of requisite decision modeling is the interaction, discussion, and even the intuitions of people called alongside to formulate a decision. This team of people interact with each other and refine, influence, and shape each other’s thoughts as the pertinent values which lead to a decision become clear (Phillips, 1984). Decisions as significant as those pertaining to the pursuit of a doctoral degree should be made in interaction with others. Specifically, if the speculation that the prominence of one college shaped the trends revealed by this research is correct, then the benefits and costs (again, more than monetary) should be carefully analyzed in concert with competent counselors.

Positivism and constructivism. The second set of theoretical implications relate to the philosophical frameworks on which quantitative and qualitative research are based. Quantitative research, based on positivism (Creswell, 2013), assumes that one reality exists and that it may be objectively measured (Sale et al., 2002). Qualitative research, based on constructivism (Creswell, 2013), does not directly contradict that, but it sometimes uses terms like *multiple realities* to shift the emphasis to people’s varying perceptions of reality (Creswell, 2013; Zamani-Gallaher et al., 2017). Quantitative research strives for objectivity (Creswell, 2013) and qualitative research thrives on subjectivity (Creswell, 2013). Quantitative research is intended to

produce generalizable conclusions (Boyce, 2012), but qualitative research is not intended to do that (Boyce, 2012; Creswell, 2013). All of these differences can be useful and can work toward balanced views of important social realities; however, if researchers are not clear in stating their frames of reference and if readers are not informed of the differences, research can be used fallaciously or deceptively. Some proponents of subjectively based research argue that objectivity in research is not only impossible (Walsham, 2015) but also undesirable (Boudana, 2011; Nordstrom & Happel-Parkins, 2016). Boudana (2011) relates this scorn for objectivity to postmodernism, citing writers who have “disdain for the ideas of truth and objectivity altogether, preferring instead the notion of multiple discourses and reflection in terms of a power struggle” (p. 387). Considering the rise of subjectively based qualitative research and the growing use of research in court battles (Lydgate, 2016) and legislation (Hochbein & Perry, 2013), which affect social policies, the understanding of research methodologies is vital.

Practical Implications

There are also practical implications of this study. Those who advise doctoral candidates can understand their students better by knowing that there are trends and understanding that those trends reflect philosophical and historical realities. With these perspectives, advisors can better guide candidates. Although there are trends, both degrees mentioned in this study (and many degrees that were omitted by the defined population of the study) and all three forms of research evaluated in this study (and others) are still current choices. Those who direct graduate programs of colleges and universities can benefit from this study also. Although the PhD Degree has greater social capital (Devos & Somerville, 2012; Stock & Siegfried, 2017; Walsham, 2015), the EdD was significantly on the rise in this study. That should prompt consideration of what is motivating candidates to choose the EdD in the state of Virginia. The rise of qualitative research

should prompt preparation of graduate faculties to serve that growing student population. The battle for the concept of fairly studying and reporting objective reality calls for a focus in colleges and universities on the philosophical backgrounds of the various research methods and on their different strengths and weaknesses. Finally, the leadership of any institution that is not producing doctoral graduates across the range of degree and methodology types should evaluate whether any change is desirable and yet within the scope of the institution's mission statement.

Recommendations for Future Research

The choices doctoral candidates make about types of doctoral degree and types of research methodology both reflect the cultures in which those people live and shape those cultures. Those choices reflect the cultures by revealing things that the candidates consider to be valuable. Those choices affect the cultures by enabling those who earn doctoral degrees to further their values in the societies in which they live (Golde, 2015). This current study endeavored only to demonstrate whether trends existed within a defined population in the years from 2007 to 2017. Further research could focus on the beliefs and values that shape the choices that doctoral candidates make. These could be qualitative studies investigating how a group of doctoral candidates made the decisions whether they would pursue a doctorate and what kind of degree to seek. A study might also be quantitative in form. It could work from instruments measuring personal values that relate to the degree choice or it could create and test instruments for such measurement. These studies could be useful to those who counsel graduate students and to those who design and direct programs of graduate study. Similarly, either quantitative or qualitative studies could be done investigating the values and beliefs which direct people in their choices of research methodology. Further understanding of the process by which people make this decision is potentially valuable.

Beyond how people make decisions, the results of those decisions are profound. First, the results for individuals are important. Return on investment (ROI) has become an important topic in higher education (Henager, 2017; Travaglianti, Babic, & Hansez, 2018). Which degree, EdD or PhD, furthers what kinds of careers? How long does it take to earn back the amount of money spent in gaining the doctoral degree? These are important questions for individuals who pursue graduate degrees. The results of methodology decisions may impact not just the individual doctoral candidate but also society. The two major research domains are associated with very different worldviews. Quantitative research is rooted in positivism and has an emphasis on objectivity (Creswell, 2013), and qualitative research is rooted in constructivism and has an emphasis on subjective interpretation (Creswell, 2013). Both forms of research have valuable roles to play, but those who create, report, and learn from research may be led to erroneous conclusions if the different worldviews of positivism and constructivism are overlooked (Warner, 2013; Lydgate, 2016). Further understanding of the relationship between worldviews and research methodology is needed.

Summary

Chapter Five discussed the findings regarding the two research questions and the null hypotheses. Both null hypotheses were rejected because data analysis showed statistically significant trends in both doctoral degree decisions and research methodology decisions. These findings were discussed with consideration of other research literature and in the context of the population that was sampled. Limitations of the study were considered, including threats to validity. Empirical, theoretical, and practical implications of the findings were discussed. Finally, recommendations for further research were presented.

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APPENDICES

Appendix A: IRB Approval

LIBERTY UNIVERSITY.
INSTITUTIONAL REVIEW BOARD

April 10, 2018

Craig H. Krueger

IRB Application 3232: Quantitative Content Analysis of Virginia Doctoral Dissertations
20072017: Trends in Degree Types and Methodologies

Dear Craig H. Krueger,

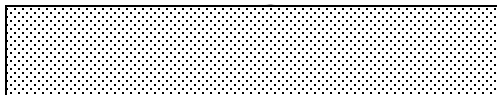
The Liberty University Institutional Review Board has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Your study does not classify as human subjects research because it will not involve the collection of identifiable, private information.

Please note that this decision only applies to your current research application, and any changes to your protocol must be reported to the Liberty IRB for verification of continued non-human subjects research status. You may report these changes by submitting a new application to the IRB and referencing the above IRB Application number.

If you have any questions about this determination or need assistance in identifying whether possible changes to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,



Administrative Chair of Institutional Research
The Graduate School

LIBERTY
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Appendix B: Variable Codes

Table 19

SPSS Variable Codes

Variable	Code
Degree	
PhD	1
EdD	2
Methodology	
Quantitative	1
Qualitative	2
Mixed methods	3