Consistency Examination of a Systematic Review and Data Analysis Report for a Social Justice Study—A Mixed Research Model

Zhidong Zhang[1] & David Smith[1]

[1] The College of Education and P-16 Integration, The University of Texas-Rio Grande Valley, Texas, USA

Correspondence: Zhidong Zhang, The College of Education and P-16 Integration, The University of Texas-Rio Grande Valley, Texas, USA. E-mail: zhidong.zhang@utrgv.edu

Abstract

This study aimed to investigate an approach for assessing the quality of doctoral dissertations, specifically focusing on the consistency between essential elements, namely the literature review and quantitative analysis results. To accomplish this, a mixed-methods design was employed.

The qualitative data were analyzed using semantic network and thematic analysis techniques, while the quantitative data were processed using SPSS procedures.

The study's findings demonstrated that this mixed-methods model effectively facilitates the examination of dissertation quality and consistency among key elements, such as the literature review and data analysis results. By integrating qualitative and quantitative approaches, researchers gain a comprehensive understanding of the dissertation's quality and the alignment between its different components.

Keywords**:** the consistency of the essential elements, mixed methods, semantic network analysis, thematic analysis

1. Introduction

Evaluating the quality of a dissertation holds immense importance for doctoral candidates and research advisers alike. To ensure a comprehensive assessment, various approaches can be employed, with the alignment of the dissertation's components emerging as a particularly valuable strategy.

The alignment of the dissertation's components encompasses a fundamental concept that permeates both the initial proposal and the subsequent development of the dissertation itself. At its core, it emphasizes the need to maintain a consistent focus throughout each section, particularly on the key components, thereby promoting coherence and clarity.

When considering the alignment of dissertation components, two critical aspects come to the forefront: focus and consistency. Focus necessitates that the doctoral candidate conducts specific and precise research rather than grappling with a broad topic. By narrowing down the theme, the research goals become more defined, serving as a guiding framework and effectively shaping the development of the literature review. Thus, the literature review will be outlined with various headings and subheadings.

In addition, consistency plays a vital role in maintaining alignment throughout the entire dissertation. It entails ensuring that every aspect, including research methods, data analysis, discussions, and conclusions, revolves around the same central theme. By adhering to this principle, a cohesive and coherent approach is achieved, thereby strengthening the overall impact and scholarly merit of the work.

Furthermore, the literature review plays a pivotal role in ensuring dissertation alignment. It must center on the research themes and seamlessly interact with the discussion and conclusion. By adeptly supporting the research objectives and establishing a strong foundation, the literature review not only contributes to overall alignment but also bolsters the credibility of the findings.

In a nutshell, the pursuit of high-quality dissertations necessitates a dedicated focus on alignment (Meloy, 2002). By embracing the principles of focus and consistency, doctoral candidates can ensure that their research remains purposeful and coherent, ultimately elevating the overall caliber of their work. A well-aligned dissertation, supported by a literature review that seamlessly integrates with the discussion and conclusion, stands as a

testament to the rigor and scholarly excellence of the research endeavor.

2. Viewpoints of the Dissertation Qualitative Examination

Over the past two decades, there has been notable growth in doctoral programs in social science and education. This growth has attracted the attention of numerous researchers and dissertation mentors, dedicated to investigating various aspects of doctoral dissertation quality (Alison, Cooley, Lewkowicz, & Nunan, 1998; Belcher, 1994; Bunton, 1999, 2002, 2005; Cooley, & Lewkowicz, 2003; Dong, 1998). Through their examination of dissertation quality, these studies have significantly contributed to enhancing the genre and the composition process.

However, despite the extensive research in this area, there remains a specific focus that has been relatively neglected: the literature review (LR) as an independent entity, as well as its associations with other chapters. In other words, the coherence and consistency within the literature review section itself, as well as its alignment with other chapters, have not received sufficient attention.

The literature review plays an essential role in crafting a doctoral dissertation, often considered a formidable undertaking (Cooley & Lewkowicz, 2003; Meloy, 2002). Nevertheless, a significant number of doctoral candidates lack the necessary training and structured support in this pivotal domain.

Furthermore, the scarcity of research regarding the interconnections between literature reviews and other components of doctoral dissertations can be attributed to the extensive and intricate nature of such studies, which consistently give rise to significant challenges (Bunton, 2002). Consequently, this study aims to conduct a comprehensive analysis of both the literature review and the discussion of research findings, employing a mixed-methods research design.

3. Modes of Inquiry, Research Methods and Techniques

Embedded within the context of a doctoral study on social factors influencing academic learning, this research aims to examine the quality of a dissertation draft. The focus lies in evaluating various aspects of the dissertation to enhance its overall caliber and scholarly impact. By delving into the intricacies of the draft, this study seeks to shed light on the consistency of different aspects of the dissertation while simultaneously examining the factors that contribute to effective academic learning in social contexts.

3.1 Research Methods and Designs

This study employs a mixed methods research design, specifically utilizing a convergent parallel model. In a convergent parallel design, quantitative and qualitative components are simultaneously included within the same phase of the research process (Zhang & Ramos, 2023a, 2023b). This design assigns equal significance to both methods, allowing for the independent analysis of each component. The ultimate aim is to integrate and interpret the results in a combined manner, providing a comprehensive understanding of the research topic (Creswell & Pablo-Clark, 2011; Zhang, & Ibarra, 2023; Zhang, 2022a, 2022b).

3.2 The Data Coding Design

This study utilized Saldana's Models (2016) as the framework for data analysis. Saldana's coding schemata were applied in this study. The initial phase, known as 'open coding' in Saldana's model, involves data collection and subsequent transcription into a text-based format. After completing the data collection, the analysis phase begins. During this stage, researchers identify emerging codes or categories while exploring the collected data. As coding is an iterative process, regular revisits and memoing are often necessary to refine and deepen the coding process.

Comparing the identified codes or categories to discern both differences and similarities among them is crucial. This initial coding system serves as the foundation, enabling the interpretation, analysis, and subsequent categorization of the data. It plays a pivotal role in facilitating a comprehensive understanding and effective organization of the data for further analysis.

In the second phase of the coding process, thematic coding was employed. Thematic analysis, which follows open coding, represents an advanced stage in data analysis and is particularly effective in research aimed at delving into participants' viewpoints, opinions, and values regarding their experiences. Through thematic analysis, the authors gains insights into the rich tapestry of perspectives surrounding the research topic.

3.3 Analytical Techniques

This study utilized three analytical techniques and software tools. During the quantitative analysis phase, SPSS (2023) was used. For the qualitative analysis phase, two types of software were employed: TATs, a semantic

network analysis tool (Kwan, 2006; Segev, 2020, 2022), and BayesiaLab, a thematic network analysis tool (Conrady & Jouffe, 2015). Semantic Network Analysis played a pivotal role in completing the first phase of coding, known as open coding. It was supported by the open coding graph (Segev, 2020), which intuitively visualized the open coding process and revealed the basic associations among the concepts. These associations aided in identifying central words that potentially represented thematic elements.

BayesiaLab (Conrady & Jouffe, 2015) was utilized to develop the thematic network, integrating Segev's open coding structure and the analysts' comprehensive understanding of the relationships between central words and potential themes. This facilitated a more nuanced exploration of the connections within the data (Zhang, 2022b). Through the use of these analytical techniques and software tools, this study conducted a thorough analysis encompassing both quantitative and qualitative aspects. This approach enhanced the research findings by providing a comprehensive understanding of the data and the relationships between different elements within it.

4. Data Sources

The data utilized in this study were sourced from a dissertation draft (Smith, 2023). Specifically, two sections of the dissertation draft were chosen for analysis: the Literature Review and the Quantitative Data Analysis Results. The Literature Review section comprised text-based data, examined during the qualitative phase of analysis. Conversely, the quantitative data analysis and results originated from a survey conducted via a questionnaire to collect quantitative data.

5. Results

The literature review of the dissertation was meticulously examined, resulting in the identification of two primary sections: "Latinos' Schooling" and "Statistics and Social Theories." These overarching sections can be further subdivided into more specific subheadings, offering a structured and comprehensive framework for the content of the dissertation.

5.1 Latinos' Schooling and Statistics

Semantic Analysis and Thematic Analysis were employed to identify keywords and central words. During the semantic analysis of "Latinos' Schooling" and "Statistics," an open coding approach was utilized, leading to the selection of approximately 80 relevant words. Figure 1 illustrates the semantic graph, highlighting several central words, such as 'students,' 'challenges,' 'discrimination,' 'academic,' 'financial,' 'college,' 'Latino,' and 'population.'
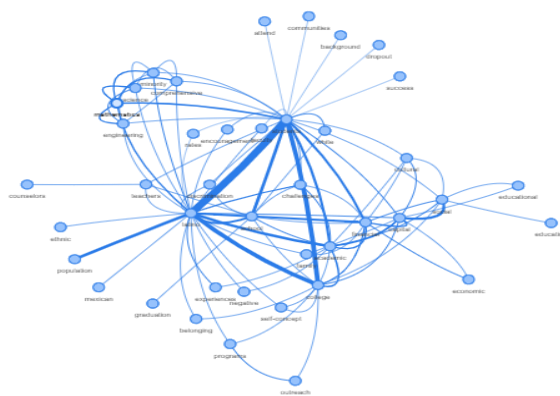

Figure 1. The Semantic Graph of Latinos' Schooling and Statistics

In Figure 2, the Thematic graph highlights central words associated with potential themes, specifically the challenges faced by Latino students. These challenges manifest in various subject areas, including mathematics, science, and engineering. Furthermore, the difficulties extend to areas such as college, financial support, and academic aspects. Additionally, Latino students themselves encounter challenges related to their minority status and experiences of discrimination.
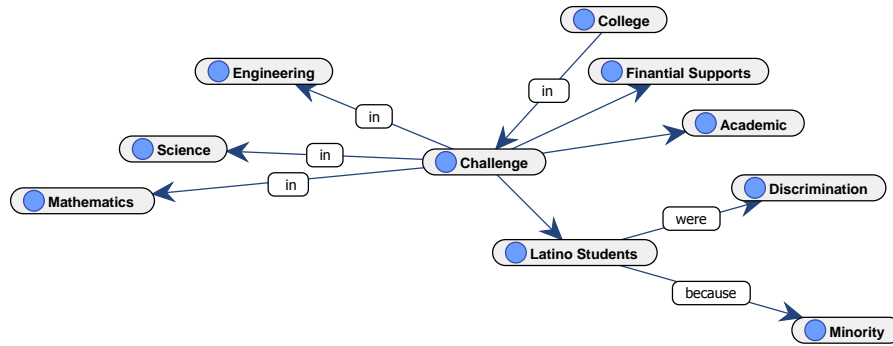
Figure 2. The Thematic Graph illustrating Latinos' Schooling and Statistics

5.2 Social Theories

Figure 3 depicts the analysis of Social Theories, wherein several crucial keywords were identified. These keywords include 'social,' 'Vygotsky,' 'learning,' 'interactions,' 'constructivism,' 'collaborate,' 'cooperative,' 'community,' 'classroom,' 'development,' 'students,' and 'settings.' Notably, the semantic network analysis revealed that central words such as 'social,' 'interactions,' 'constructivism,' 'learning,' 'setting,' 'students,' and 'settings' played a dominant role in the network.
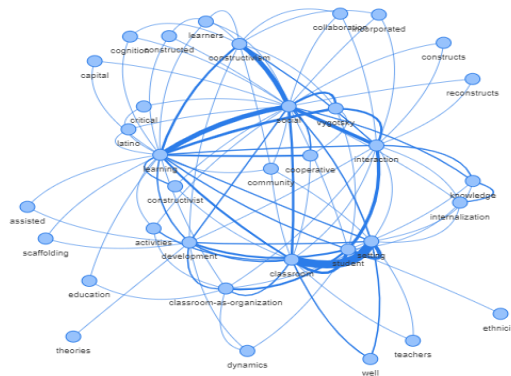

Figure 3. The Semantic Graph of Social Theories

In Figure 4, the thematic graph depicting Social Theories showcases keywords central to potential themes: 'social,' 'interactions,' 'constructivism,' 'learning,' 'students,' and 'settings.' This graph visually represents the connections between these central words, illustrating their associations with the texts and how they extend to encompass other pertinent concepts.
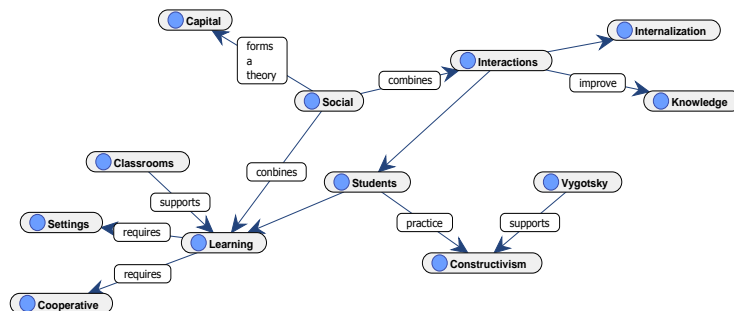

Figure 4. The Thematic Graph of Social Theories

5.3 Discussion of the Semantic and Thematic Analysis in the Study

The relationship between thematic analysis and semantic analysis becomes particularly apparent when considering their shared goal of extracting meaningful insights from data. While thematic analysis primarily focuses on identifying and categorizing themes in qualitative data, it can benefit from the principles of semantic analysis to enhance the depth of understanding. In the context of thematic analysis, semantic analysis can be employed to delve into the finer nuances of language, enabling a more nuanced exploration of the identified themes. By recognizing connections between significant words and concepts within the text, semantic analysis can provide a deeper layer of interpretation, allowing researchers to gain a holistic and comprehensive understanding of the subject matter at hand.

The integration of these two analytical approaches can be particularly valuable in multidisciplinary research, where a combined methodology offers a richer and more robust analysis of complex datasets. Thematic analysis and semantic analysis are not isolated techniques; rather, they complement each other to provide a more comprehensive and insightful examination of textual data across various fields and domains.

In the section on Latinos' Schooling and Statistics, for semantic and thematic analysis, several words were highlighted, including 'Challenges,' 'Discrimination,' 'Academic,' 'Financial,' 'College,' and 'Latino.' Additionally, the thematic network suggested that 'Challenge' was a central word. As shown in Figure 2, seven keywords/concepts related to the Challenge are depicted, six of which were identified by the Challenge. This indicates that the Challenge is expressed in a multifaceted manner.

In the section on Social Theories, both Figure 3, the semantic graph, and Figure 4, the thematic graph, demonstrate consistency among the keywords/concepts: 'Learning,' 'Social,' 'Students,' 'Interaction,' and 'Class.' Moreover, the thematic graph illustrates the connections among these elements. For instance, 'Interaction' shows two connections: 'Internalization' and 'Knowledge,' while 'Learning' is linked to 'Classroom,' 'Settings,' and 'Cooperative.' This thematic graph presents a highly enriched network of connections among these concepts. However, there is still room for further discussion.

In summary, the semantic and thematic graphs collaborate in analyzing themes within both sections of 'Latino Schooling and Statistics' and 'Social Theories.' These two graphs demonstrate a remarkable level of consistency in portraying the core concepts of the semantic and thematic networks.

5.4 Quantitative Analysis

In the quantitative aspect, data collection entailed administering a questionnaire comprising three phases: Academic Challenges, Academic Resources, and College Student Outreach Programs. In the initial phase, participants were presented with four items that specifically addressed financial difficulties, language issues, experiences of discrimination, and general academic challenges.

In the second phase, four items were incorporated to evaluate students' access to academic resources, including tutorial assistance in subjects like math, writing, physics/chemistry, as well as other services offered within the college environment (Zhang & Garcia, 2022; Zhang & Guanzon, 2022). Phase three of the questionnaire examined the involvement of students in various College Student Outreach Programs. These programs encompassed participation in learning community councils/programs such as the community engagement council, family involvement council, Upward Bound Math/Science program, educational talent search program, leadership, and mentoring program, as well as the engineering, math, and science mentors club.

The study included an extensive analysis exploring various aspects. In this instance, the authors focused on one specific analysis to provide an example.

Table 1. Pairwise Comparison of College Classification for the Question: 'I Experienced Discrimination in the College Setting'

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.
Sophomore-Senior	-18.595	8.399	-2.214	**.027**
Sophomore-Graduate	-23.845	10.272	-2.321	**.020**

The authors examined the causal relationships between College Classification and the question "I experienced discrimination in the college setting." The findings, presented in Table 1, indicate significant differences in pair comparisons between Sophomore and Senior, as well as between Sophomore and Graduate, regarding the experience of discrimination in the college setting. To visually demonstrate these findings, Figure 5 displays the mean ranks of College Classification for this particular question.
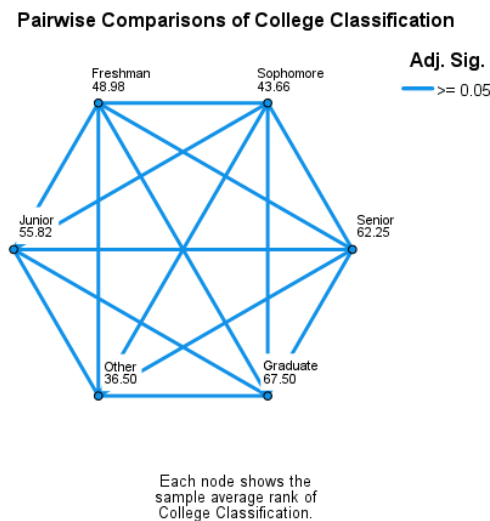

Figure 5. The Mean Rank Differences of Question, I Experienced Discrimination in the College Setting in College Classifications

6. Current Mixed Methods Approach, Paradigms, and Results

This study employed a concurrent mixed methods approach, wherein both components were executed almost simultaneously. As per Morse (Schoonenboom & Johnson, 2017), concurrence is represented by a "+" between components, for instance, QUAL + Quan. It's crucial to note that the utilization of an uppercase letter for one component and a lowercase letter for another within the same design signifies that one is primary while the other is secondary or supplemental. In this study, the QUAL phase comprises two components: semantic analysis and thematic analysis. Consequently, this study embodies a comprehensive current mixed methods design.

6.1 Paradigms

This composite mixed-method study adopts pragmatism as its paradigm. Pragmatist researchers focus on 'what' and 'how' they research based on their intended consequences, aiming to determine their desired outcomes. In the case of mixed methods researchers, it is essential for them to establish a clear purpose for combining quantitative and qualitative data, along with a well-founded rationale justifying the reasons for this integration" (Creswell, 2009). This study aims to examine the associations between the dissertation literature review and the quantitative analysis. The qualitative data is derived from various parts of the literature review, while the quantitative data is obtained from the questionnaire. Thus, pragmatism as the paradigm of this study is appropriate.
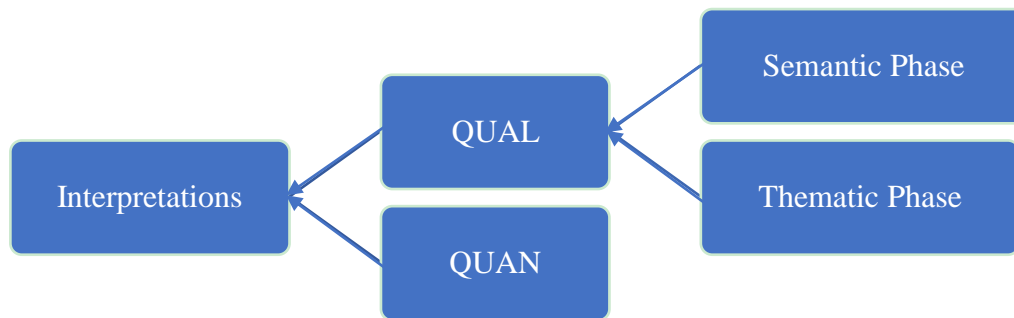
Figure 6. Composite Concurrent Model for the Study

6.2 Discussion of the Results From Both Qualitative and Quantitative Phases

This study employs a comprehensive mixed research approach to investigate the interrelationship and coherence of specific aspects within a doctoral dissertation. The findings from the two qualitative phases, namely semantic and thematic analyses, exhibit congruence, highlighting the core terminology and concepts as intended by the authors. Additionally, the quantitative phase, which comprises questionnaire data, encompasses three distinct facets: Academic Challenges, Academic Resources, and College Student Outreach Programs. These aspects are also correlated with the central concepts.

Furthermore, the study reports several significant results. It addresses not only the issue of consistency among the components of a doctoral dissertation but also presents an alternative method for assessing dissertation quality. This approach replaces subjective estimations of dissertation quality and the debates between differing opinions with a structured set of rules and strategies to follow.

7. Summary and Scholarly Significance

This study utilized a mixed methods design to explore a strategy for evaluating the quality and consistency of key components in a doctoral dissertation. The researchers employed a convergent parallel model, integrating both quantitative and qualitative components within the same phase of the research process. For data analysis, three analytical techniques and software tools were used. The quantitative analysis phase utilized SPSS (2023), while the qualitative analysis phase employed two types of software: TATs, a semantic network analysis (Segev, 2022), and BayesiaLab (Conrady & Jouffe, 2015) for thematic analysis.

The semantic network analysis played a crucial role in completing the open coding phase, while BayesiaLab facilitated the thematic analysis by referencing the open coding information derived from the semantic network analysis. The mixed research model yielded compelling evidence of a strong consistency between the literature review and quantitative analysis. However, due to reporting limitations, more detailed information about these findings could not be provided in this study.

For example, Figure 2 depicted central words such as "Latino Students" and "Discrimination," which were also covered in the quantitative analysis. Similarly, Figure 4 highlighted central words such as "Learning," "Social Interaction," "Knowledge," and "Cooperative," which were also addressed in the quantitative analysis. In summary, the semantic network analysis and thematic analysis offer effective tools and strategies for doctoral students and dissertation mentors to examine the consistency among essential elements, such as the literature review, data analysis, and discussion.

8. Limitations and Future Study Suggestions of the Study

Firstly, there may be a debate surrounding the mixed methods model employed in our study. We utilized a composite mixed-method model, integrating two distinct qualitative phases: Semantic Analysis and Thematic Analysis. However, further clarification and discussion are needed regarding the exact nature of the relationship between these two phases—whether they are sequential or parallel. Secondly, exploring the possibility of incorporating a more substantial amount of qualitative data could enhance the depth and scope of qualitative data

representations within our model.

Expanding upon the first point, a detailed clarification of the interplay between Semantic Analysis and Thematic Analysis will not only provide a clearer roadmap for the research methodology but also enhance the overall coherence and informativeness of the study. This in-depth exploration of their interaction will shed light on how these analytical approaches complement each other, offering valuable insights that can be leveraged to yield a more robust and insightful research outcome. Delving deeper into the intricacies of this interplay, our aim is to present a comprehensive and well-informed analysis that will benefit both the research process and its final findings.

Furthermore, in relation to the second point, collecting additional qualitative data has the potential to yield a richer and more nuanced comprehension of the subject matter. This augmentation of qualitative data can play a pivotal role in elevating the overall quality and dependability of our research outcomes, ensuring that our conclusions are both robust and trustworthy.

In addition, addressing these concerns and implementing essential adjustments to the mixed methods model not only resolves potential limitations but also paves the way for more reliable and insightful findings. This proactive approach stands to benefit not only the research process itself but also the broader academic community, as our work can serve as a valuable reference point and contribute to a deeper understanding of the field.

References

Alison, D., Cooley, L., Lewkowicz, J., & Nunan, D. (1998). Dissertation writing in action: The development of a dissertation writing support program for ESL graduate research students. *English for Specific Purposes 17*(2), 199-217.

Belcher, D. (1994). The apprenticeship approach to advanced academic literacy: Graduate students and their mentors. *English for Specific Purposes, 13*(1), 23-34.

Bunton, D. (1999). The use of higher level metatext in Ph.D. theses. *English for Specific Purposes, 18*(1), 541-556.

Bunton, D. (2002). Generic moves in PhD theses introductions. In J. Flowerdew (Ed.), *Academic discourse* (pp. 57-75). Routledge.

Bunton, D. (2005). The structure of PhD conclusion chapters. *Journal of English for Academic Purposes, 4*(3), 207-224.

Conrady, S., & Jouffe, L. (2015). *Bayesian networks and BayesiaLab: a practical introduction for researchers.* Bayesia USA.

Cooley, L., & Lewkowicz, J. (2003). *Dissertation writing in practice: Turning ideas into text.* Aberdeen: Hong Kong University Press.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research.* Sage.

Dong, Y. R. (1998). Non-native graduate students' thesis/dissertation writing in science: self-reports by students and their advisors from two US institutions, *English for Specific Purposes, 17*(4), 369-390.

Kwan, B. S. C. (2006). The schematic structure of literature reviews in doctoral theses of applied linguistics. *English for Specific Purposes, 25*(1), 30-55.

Meloy, J. M. (2002). *Writing the qualitative dissertation: Understanding by doing* (2nd ed.). Lawrence Erlbaum.

Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). London: Sage.

Schoonenboom, J., & Johnson, B. (2017). How to construct a mixed methods research design. *Köln Z Soziol, 69*, 107-131.

Segev, E. (2020).Textual network analysis: Detecting prevailing themes and biases in international news and social media. *Sociology Compass, 14*(4), 1-14.

Segev, E. (2022). *Analysis Semantic Network Analysis in Social Sciences.* New York: Routledge.

Smith, D. T. (2023). *Examining social factors' influencing Latino students' academic learning in Rio Grande Valley via a quantitative design* [Unpublished doctoral dissertation]. The University of Texas—Rio Grande Valley.

SPSS. (2023). *IBM SPSS statistics.* Retrieved July 14, 2023 from https://www.ibm.com/products/spss-statistics

Zhang, Z. (2022a). A mixed methods design for assessing physics learning in the online learning environment.

Journal of Education and Development, *6*(2), 1-8.

Zhang, Z. (2022b). Diagnostically cognitive assessment of complex semantic explanations and learning: A Bayesian network approach. *Journal of Education and Development*, *6*(4), 1-14.

Zhang, Z., & Garcia, L. (2023). Examining dimensionality and validity of the academic integrity survey instrument. *Journal of Education and Development, 7*(1), 46-51.

Zhang, Z., & Guanzon, A. (2022). A mixed assessment for the science learning via a Bayesian network Representation. *Journal of Education and Development, 6*(5), 1-7.

Zhang, Z., & Ibarra, B. (2023, in Press). Mapping the problem statement and study purposes to the quantitative analysis: Insights from mixed methods perspectives. *International Education Studies.*

Zhang, Z., & Ramos, L. (2023). Exploring a cooperative learning model with a mixed methods design. *Journal of Education and Development, 7*(1), 76-79.

Zhang, Z., & Ramos, L. (2023). The exploratory sequential design with a generalized linear model for the learning strategy analysis. *Journal of Education and Development, 7*(2), 1-7.