Deficiencies and Responses to Research Issues in Master of Education Theses

Xiaobing Zhou[1,a,*], Yuying Shang[1,b], Yingbin Ma[1,c]

[1]College of Mathematics and Information Science, Henan Normal University, Xinxiang, Henan, 453007, China
[a]737625906@qq.com, [b]1197406474@qq.com, [c]274591575@qq.com
*Corresponding author

Abstract: *Through analyzing and studying a total of 108 subject teaching (mathematics) professional dissertations from nearly ten teacher training universities across China, it is found that the extraction of research issues in the professional dissertations of the Master of Education degree is deficient in four main areas. By analyzing each of these specific questions, three strategies for extracting and writing research issues for the subject teaching (mathematics) dissertation are proposed. It is hoped that these improvements will provide some help in writing M.Ed. dissertations, so that more M.Ed. students with high-quality research skills can be trained to contribute to the development of education.*

Keywords: *Subject teaching (mathematics); Dissertation; Questions; Strategies*

1. Introduction

With the continuous improvement of the Master of Education training programs in all teacher training colleges and universities, the quality of their dissertations is also getting more and more attention. Whereas the research issue is the centerpiece of the dissertation writing process, and the merit of the issue determines the quality of the whole dissertation. Therefore, issue awareness plays an important role in the development of graduate students' research skills. Recently, when reviewing the Master of Education (M.Ed.) graduation dissertation, there is a growing sense that graduate students do not have a strong sense of research issues, and that it is urgent to enhance the M.Ed.'s sense of research issues. Through the analysis and study of 108 professional dissertations of master of education in the direction of subject teaching (mathematics) in the Knowledge Network and Wanfang Database, the author found that there are many problems in their research issues that need to be highly concerned and solved in a timely manner.

2. Deficiencies in Research Issues in Master of Education Theses

2.1 Lack of Clarity in Issue Definition

Lack of clarity in issue definition is one of the common problems in M.Ed. dissertations, as evidenced by a research issue that is too vague, not clearly defined, or too broad. The vagueness of the research issue can lead to outcomes such as difficulty in developing a research design, inappropriate choice of research methodology, difficulty in analyzing data, and questioning the credibility and validity of the research results, while overly broad definitions can make it difficult to delve deeper into a limited number of dissertation pages, thus affecting the depth and accuracy of the overall study.

For example, the research issues in the master's thesis "A Study on the Exercises of Compulsory I of the High School Mathematics Textbook of Humanistic Teaching A Version under the Perspective of Core Literacy" are: ①Distribution of exercises in high school mathematics textbooks in terms of column positions and types of contexts, and the implication of the two main mathematical core literacies and their levels in terms of academic levels and knowledge forms. ②How are the locations and types of contexts of the exercises related to the levels of core mathematical literacy? ③Is there any consistency in the levels of mathematical core literacy in the exercises of the textbook according to the two different classifications of "academic level" and "knowledge pattern"[1]? In response to the above question 1 concerning the distribution of exercises in the textbook and the embeddedness of core

literacy, the definition of the research content discussed here is not very clear, and how to give a clear and specific consideration to the "column position" and "scenario type" requires a clearer operational definition to accomplish it. It would be more reasonable to begin by describing how "column positions" and "context types" are measured and assessed, and to elaborate on how "core mathematics literacy" is defined and measured. For question 2, which explored the relationship between the location and type of context of exercises and the level of core literacy, there was a lack of specific hypotheses or expected outcomes, and specific research hypotheses needed to be given, for example, "It is expected that exercises located in a specific column are more likely to promote the development of higher-order mathematical core literacy." For question 3, when comparing the two different ways of classifying core literacy, it is also important to clarify the specific operations and standards of the two ways, and the authors should elaborate on the specific standards and measurement methods of the two ways of classifying the "academic level" and the "knowledge pattern". It would be more reasonable to anticipate possible consistencies or differences.

For research issues that are too broad, such as the master's thesis "Research on the Cultivation of Junior High School Students' Mathematical Reading Ability in the Era of Big Reading"[2], the focus of the research is the cultivation of junior high school students' mathematical reading ability, which includes the comprehension of mathematical language, the comprehension of mathematical concepts as well as the comprehension and application of mathematical symbols. The article is not only to explore the current situation of middle school students' various reading abilities above, but also to talk about the influencing factors and cultivation strategies, it is obvious that a master's thesis simply can't talk about so many issues in a proper depth, so the research issue of this thesis is too broad to be spread out in detail, only as a slapdash and shallow as the water. In addition, there is a master's thesis, "Research on the Connotation Awareness of Moral Education in the Discipline of High School Mathematics Teachers", whose research questions are: ① How do high school mathematics teachers know the connotation of moral education in mathematics subject? ② What are the factors that influence the perception of moral education within the subject matter of high school teachers? [3]? The research question here fails to clearly put forward the specific objectives or research hypotheses of the study, making the study insufficiently oriented and conclusive, and the focus of the research question should be placed on how to enhance the understanding of the connotation of moral education in the discipline of high school mathematics teachers, or the implementation of the strategy of moral education in the discipline of high school mathematics teachers and the development of paths that are more appropriate.

2.2 Poor Logical Linkages between Issues

The relevance of the research issues is very important in a master's thesis in education. Research issues with strong relevance can clearly demonstrate the purpose and significance of the research, which can more effectively guide the structure and research methodology of the whole thesis and make the thesis more logical and academically valuable. And the research issues raised by M.Ed. are usually more independent from each other, cut off from each other, illogical, and the relationship between the research issues in terms of progression, priority, etc. is not well represented. For example, the research question in the master's thesis, "A Survey of the Current Status of High School Students' Mathematical Modeling Literacy and Teaching Research,[4]" begins directly with "What is the current status of high school students' mathematical modeling literacy level? What are the influencing factors?" In the absence of the theoretical basis of the components of mathematical modeling and the division of the level of mathematical modeling based on the level of high and low, directly said that the current situation of high school students' mathematical modeling literacy, obviously unreasonable, according to the logical relationship, in the theoretical basis to analyze the level of high school students' mathematical modeling literacy level of the current situation will be more persuasive.

In another master's thesis, "A Study of a Unit Instructional Design for Quadratic Equations Based on Core Mathematics Literacy", the research questions are: ①What are the core literacies that the content of "quadratic equations" corresponds to? ②What do teachers need to do when teaching quadratic equations? ③How to design a unit teaching design for "quadratic equations" based on the core literacy in mathematics[5]? Its question 1 focuses on identifying the mathematical core literacy corresponding to the content of the teaching of quadratic equations by analyzing the theory, while the next step should be to analyze what problems exist in the development of students' current core literacy, or what is the current status of the development of the core literacy. It is only after this question that the design and implementation of a unit on "Quadratic Equations" can be carried out, and the problem in this thesis lacks the current state of students' learning, which makes the article less logical. In addition,

the master's thesis, "A Study on Countermeasures on How to Improve Students' Mathematical Cultural Literacy in the Classroom," has the following research questions: ①What are the factors that hinder the improvement of students' mathematical cultural literacy in high school mathematics classrooms? ② How to solve the existing problems and improve students' mathematical cultural literacy[6]? These two questions only point out the influencing factors and countermeasures, and still do not explain the current situation of the cultivation of students' mathematical cultural literacy.

2.3 Lack of Theoretical and Practical Nature of Research Issues

Lack of theoretical and practical nature of the research issue refers to the fact that during the research process, the research issue is not sufficiently based on the existing theoretical foundation, or disconnected from the actual application scenarios, resulting in the lack of depth and application value of the research results. This may be due to the fact that the research issues are not based on or linked to existing theoretical frameworks, the lack of in-depth understanding and application of relevant theories, and the fact that the research issues are not validated by empirical studies, resulting in a discrepancy between theoretical assumptions and the reality of the situation. For example, a researcher conducted a study entitled "Research on the Effectiveness of Using Online Learning Platforms", and the research issue was: Does the online learning platform improve students' learning efficiency? The research question is not based on existing educational or learning theories to explore the potential impact of online learning platforms, and the question does not indicate how the results of the research can be applied to actual teaching and learning and how to assess the specific performance of "learning effectiveness", which would make the research issue lack of theoretical and practicality.

Another example is the master's thesis "Research on Microtopic Teaching Strategies in Senior Mathematics Review Classes", in which the research questions are: ① What is the current situation of senior mathematics review classes? How much do front-line teachers know about "microthematic" teaching? ② How to select appropriate content for "micro-themes" with the review of functions and derivatives as the knowledge carrier in senior high school? How to design the selected content to achieve the teaching objectives? ③ How effective is the teaching of "micro-topics" on students' revision[7]? For question 1, its questions, while helpful in understanding the basics of current teaching practice, lacked some practicality in considering teaching effectiveness and student feedback. Question 2 focuses on the selection and design of instructional content, but more specific operational definitions and standards are needed so that the authors can identify the specific requirements for instructional objectives and explore how these objectives can be achieved through microtopic content. Question 3 focuses on the effectiveness of teachers' teaching and requires clearer assessment criteria and methods. In fact the authors could have designed specific assessment tools and methods, such as tests and questionnaires, to determine the specific impact of microtopic teaching on the effectiveness of student revision would have been more appropriate.

2.4 Mismatch Between Research Design, Conclusions and Research Issues

In the course of their research projects, M.Ed. students generally identify a clear and relatively stable research direction, formulate the questions to be studied, and formulate a research design and research objectives. However, a small number of dissertation research designs are not centered on the research issues, and the designs are not targeted, resulting in the findings found and the conclusions distilled are not well directed. There are also dissertations that start with the research objectives and do not end with them, completely disregarding them in their conclusions and failing to answer the questions they posed at the beginning of the study[8]. For example, the master's thesis "Research on the Practice of Teaching Elementary Mathematics Based on Mathematical Beauty" raised two questions in the introductory part of the study of mathematical beauty: first, whether manifesting mathematical beauty has a positive effect on students, and second, whether there is a value to manifesting mathematical beauty in elementary mathematics teaching[9]. The two questions were answered directly after the questions were posed based on the findings of previous research and were not substantiated with their own research investigations and findings, resulting in the research issues presenting results that were not convincing. The subsequent research design also focuses on the concepts of elementary mathematics teaching and learning as well as teaching strategies that reveal the beauty of mathematics, which does not correspond to the focus of the problem in the introductory essay, which is a mismatch between the research issues and the research design.

3. Suggestions for Improving Research Issues in Master of Education Theses

3.1 Clearly Position the Research Object and Issue

Ensuring that the research object is clear and the research issue is clear and specific will help to focus efforts and resources on in-depth research, which can be done by limiting the research object, clearly defining the variables, or selecting the theoretical framework to be determined to clearly position the research. Clearly locating the research population is to determine what group (high school students, middle school students), phenomenon (classroom interactions, learning outcomes), setting (schools, districts), or variable the study focuses on. It is a critical step in research design, ensuring that the study has a clear focus and a specific scope. Clarifying the subject of the study helps to develop clear research issues and objectives, which in turn leads to a more organized research process. Clearly locating a research question is the process of translating a broad research interest or topic into a specific, well-defined, and actionable research issues, which helps to ensure that the following research has a clear focus and direction, and helps students maintain a clear goal and path in their research. Only after clarifying the object of study and the research issue will the students' research be more specific, relevant and of practical value.

When writing the dissertation for the Master of Education, the following reference steps can be followed to clearly locate the research object and issue: ① Determine the research field, where it can be chosen according to the students' personal interests, such as: teaching methodology, students' psychology, educational technology, educational policy and so on. This requires students to read the literature in the relevant field to understand the current hotspots and gaps in research so that they can determine the direction of their research. ② Define the target group of the study. The first step is to identify the target group, that is, to determine whether the research is aimed at students, parents or teachers as well as educational policy makers, and to further define the specific characteristics of the research, such as age groups, grades, and subjects. ③Identify and narrow down the research issue. Define the educational issues or aspects of improvement that you want to address. The issues can be difficulties in actual teaching, the effects of educational policies, etc. Here you need to specify the issue to avoid them being too broad. For example, in the research issue "How to improve students' academic performance", we can narrow down the research issue by limiting the research group, the teaching method and the type of subject to "How does the use of interactive teaching method affect students' academic performance in secondary school mathematics classroom". Students' academic performance in the secondary school mathematics classroom".The above steps will help to identify the research object and the issue more clearly, and will provide a basis for writing the master's thesis.

3.2 Identifying and Refining Research Issues in Teaching Practice[10]

Focusing on the training objectives of the Master of Education, the research issues must be rooted in front-line classroom teaching in order to make the research flesh and blood. Therefore, the school does a good job in the educational practice of master of education, improves the process management, and the students continuously enhance the awareness of problems in the educational practice, and guides the students to find out the issues and summarize the issues in the educational apprenticeship and educational internship, and in this aspect, we should ensure the specific objectives and requirements of the internship of master of education, including the time schedule of the internship, the internship content, and the required skills, etc., and make sure that these objectives are in line with the course curriculum and the students' learning objectives. In the process of designing and organizing internship activities, it is necessary to be able to cover all kinds of teaching scenarios and environments required by M.Ed. students, arrange internships in different schools, different grades or different educational institutions in order to enrich the students' teaching experience, and at the same time, there should be a sound guidance and support system for the M.Ed.'s off-site traineeships and externships to provide protection, provide a dual-mentor system in which the internship instructor and the mentors to provide regular feedback and guidance to enhance the teaching of M.Ed. students. In addition, the teaching practice in the frontline classroom of the M.Ed. is to pay attention to the learning, comprehension difficulties, common errors, and their mastery of mathematical concepts and skills of the elementary and middle school students in the classroom. These observations and findings can be recorded through teaching journals, student assignments, classroom interactions, etc., which can be combined with the literature, and in turn, can be used to distill a research question of interest to the students.

Then we can refine specific research issues in teaching practice according to the following steps: ① First, choose a broad topic of interest, such as "teaching effectiveness", "student motivation", or "teaching methods", etc., and understand the background of the topic, including relevant theoretical frameworks and existing research results. ② Conduct a literature review. Review the latest relevant literature to identify key findings, theoretical controversies, research gaps, and unresolved issues in existing research. Summarize the key findings in the literature, noting which issues have been well researched and those that need to be further explored. ③ Observation and data collection. Observe teaching practices, student behaviors, educational strategies, etc., in the educational practice environment, collect real data and cases, and obtain the views and experiences of teachers, students, parents, etc., on specific issues by communicating with them. ④ Identify specific aspects of the issue. Identify specific aspects of the issue that are worthy of study from observations and literature. For example, if it is found that students do not perform well when using educational technology, then the research issue can be specifically refined to "the acceptability and effectiveness of students' use of a particular educational technology". By following these steps, we can distill research issues from specific teaching practices.

3.3 Polishing the Logical Relationships and Clarifying the Research Sequence

Research issues do not happen overnight; teachers and students need to commit themselves for a long time, keep thinking and discussing, keep polishing, and rationalize the logical relationship between research issues as well as the sequence of research. Ensure that each research issue posed is clear, independent and interrelated. Polishing the logical order between research issues and clarifying the sequence of research is the key to ensuring that the research is systematic and coherent, while the main issue in the research is the core of the research, which is usually broader and more comprehensive, students need to break down the main research issue into a number of specific sub-questions after locating the main research issue in order to facilitate more systematic study of the main issue, and this process is a critical part of the process. At the stage of unpacking the main issue, it should be ensured that each sub-question is specific, clear and easy to operationalize to support the answer to the main research issue. In dismantling the main issue, we need to consider four aspects: assessment of the current situation, influencing factors, intervention strategies, and evaluation and adjustment.

The main issue, "How to improve student engagement in secondary school mathematics classrooms", is then taken as an example to be broken down, and the first aspect of the assessment of the current situation is considered, from which two issues need to be taken into account: the current situation of the students' level and the current situation of the research methodology. This leads to two sub- issues: ① What is the current level of student engagement in secondary school math classrooms? For this issue, investigating and assessing the current level of student engagement requires the use of questionnaires, observations, and other methods of data collection. ② What are the existing assessment tools and methods? How to measure the level of student engagement; Next, consider the second aspect: influencing factors, which can be approached in terms of both students and teachers, leading to two sub- issues: ① What factors influence students' engagement in the math classroom? That is, to identify the factors that may affect the level of participation, such as teaching methods, classroom environment, and individual differences of students. ② How do teachers' teaching styles and methods affect student engagement? Explore the impact of different teaching styles and methods on student engagement; Next, consider the third area: intervention strategies, that is, how to facilitate the study through some means, which is a key stage in implementing the study and again can be broken down into two sub- issues: ① Which of the existing instructional strategies have been shown to be effective in enhancing student engagement? Investigate and evaluate a variety of proven instructional strategies such as interactive teaching, gamification, etc. ② How can these effective teaching strategies be applied in the actual classroom? That is, to design and implement specific methods of strategy application and collect feedback and data; The last aspect to be considered: evaluation and adjustment, where issues are identified and adjustments are made by observing the results, two sub- issues can be obtained: ① What was the effect of the implementation? Has student engagement improved? Evaluate the effectiveness of the implementation and reassess the improved engagement using a measurement tool. ② How can instructional strategies be adapted to further enhance student engagement based on assessment results? Based on the assessment results of the effectiveness, explore how to optimize and adjust the teaching strategies. In the process of formulating the sub-issues, regular feedback needs to be sought from the tutor to ensure that the sub-problems are broken down rationally, specifically and closely related to the main issue.

4. Conclusion

In general, the research issue in the dissertation of master's degree in education has a pivotal role in the dissertation writing. By analyzing the current research issues in the dissertation, this paper summarizes four misunderstandings in extracting research issues for master of education, which are unclear definition of the issue, weak logical correlation between the issues, lack of theoretical and practical aspects of the research issues, and lack of correspondence between the research design, conclusions, and the researched issues. A series of recommendations are made based on these issues, and it is hoped that the recommendations will help to improve the writing of M.Ed. theses, as well as provide a useful reference for future research.

Acknowledgement

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