Thesis & Two Paper Documents

Thesis:
The following documents are intended to provide guidance in the content and organization of a thesis. These documents are not the only way a thesis can be organized and written, but again, their purpose is to act as guidelines for you to follow as you write your thesis. Your advisor and committee will provide you with more suggestions and guidelines and determine the final format of your paper.

Remember, your paper must follow the MSU Thesis and Major Paper Guidelines. These are available online at [http://www.misu.nodak.edu/graduate/pdf/thesis_and_major_paper_2005.pdf](http://www.misu.nodak.edu/graduate/pdf/thesis_and_major_paper_2005.pdf). Also remember that your headings, references, citations, quotations, tables, figures, etc. must follow APA guidelines (5th edition). If your study involves human subjects, it must be approved by IRB prior to data collection.

Two Paper Writing Project:
The two paper writing project has less formal guidelines than a thesis. Past graduate students have called these “book reports” since much of the content is a review and synthesis of literature about a topic. The content and organization of the two papers is primarily determined by your advisor and your committee members. You should use headings to organize these papers and follow the two paper guidelines given in the MSU Thesis and Major Paper Guidelines. Like a thesis, headings, references, citations, quotations, tables, figures, etc. must follow APA guidelines (5th edition).

There are copies of previous MAT students’ theses and two papers in the office, Model Hall room 108, and in the Gordon Olson Library. I have a personal copy of Sue Forster’s thesis in my office if you would like to see it. It is very well written and an excellent example upon which to model your thesis.
CHAPTER ONE
INTRODUCTION

Introduction to the Study
- Introduce the reader to your study.

1. Background of the Problem
- Context and significance of the problem
- Write about the problem in terms of knowledge and practice.
- How did the problem arise?
- Why is the problem significant?
- Why is it worth studying? Why is it worth our time as a researcher?
- Use literature to support your explanations

2. Problem Statement
- The problem/area of concern
- “The research problem is...”
- In one or two sentences, summarize the problem.
- Not later than p. 4 but not p. 1

3. Purpose of the Study
- Your specific purpose(s) and/or objective(s) for the study
- What do I/researcher intend to do about the problem
- Your purpose statement

4. Importance/Significance of the [your] Study
- Justify your study
- This is different than the significance of the problem—this is the significance of your study
- Why is your study important?
- Why should the reader care about what you plan to do?
- Why is it worth the reader’s time?

5. Rationale/Theoretical Basis/Framework for the Study
- What one major theory would you consider important to your study (if there is one). For example, your study might be based on Piaget’s theory of cognitive development

6. Research Hypothesis/Question [to be answered: one transcendent hypothesis or question]
- Also indicate what you expect to happen, your hypotheses about the study.

- Transition sentence
Description of the [your] Study

1. Definition [operational definitions] of Terms [in your study]
   - Define terms that are ambiguous

2. Assumptions, Limitations, and Delimitations [of your study]
   - An assumption is something you have to assume to do the study.
   - A limitation is something outside of your control that limits the study.
     - Example: Who is available for your study,
   - A delimitation is something within your control or imposed by you that limits the study.
     - Example: research design, time observing, how you chose the sample
   - If you are doing a qualitative study, you must include a description of yourself relative to the study (not very long) to help the reader to identify possible bias factors. This is done at the end of chapter one before the summary. You may want to expand on this in chapter three.

3. Methodologies Used
   - Briefly describe the methodologies used in your study.

Summary
   - Just that, a summary of what you just told them. Transition the reader into the next chapter and what is to come in the paper.

   - The problem should become more crystallized as you do the review of literature.
   - The problem is usually broader than the purpose and question/hypothesis.
   - This chapter funnels down—broad (the problem) to specific (the purpose and questions of your study).
   - Keep in mind: You are trying to improve knowledge and practice!

Note: Items in bold are suggested headings for the chapter. You should add your own headings as needed.
CHAPTER TWO
REVIEW OF LITERATURE

Introduction
1. Tell them what you are going to tell them.

Synthesis of the Literature
This section should include a synthesis of literature related to your study. How you organize the synthesis will depend on what you have. You may want to do it by themes, chronologically, from the broader problem to the more specific question of your study, etc. You should use appropriate headings to organize the what you write. In any case you should consider including the following in your synthesis of the literature.

1. Criteria for Selecting the [used] Literature
   - Identifying what types of literature are included and why
     - Limits, guidelines as to what you include or exclude (author credibility), strengths, weaknesses, publication dates.

2. Context of the Problem
   - Elaborate on background—give the big picture of the problem.

3. Current Understanding of the Problem
   - Interpretive summary—What do we know about the problem?

4. Review of Previous Research Findings and Opinions
   - Might want to combine the above two sections.

5. Theoretical Framework (i.e., theory of learning that supports your study, like Piaget or Vigoski)

6. Other themes you find important...identified by headings

7. Review of Methodologies [used in other studies]
   1. It is just as important to talk about HOW others did studies as it is to discuss their results.

Evaluation of the Literature—Making judgments about the literature you reviewed.

1. Strengths and Weaknesses of the Literature
   - Weaknesses and strengths of the literature—consider the types of studies, size of samples, sampling methods, date of studies, etc.
   - Gaps in the literature—no literature.
   - Saturation of literature on a topic—abundance of literature.
2. **Opportunities for Further Study**
   - Is there enough theory, tested enough, etc?
   - What the lit says about future research (in hopes to support your research design).
   - What else should be studies relative to the problem

**Summary**
- Tell us what you just told us, indicating the most important points of the lit review and their relationship to your study, and transition into the next chapter.

- Length will vary depending on the amount of studies in existence that impact your study.
- How do you know when you are done? Probably when your advisor/committee says you have enough literature.

Note: Items in bold are *suggested* headings for the chapter. You should add your own headings as needed.
CHAPTER THREE

METHODOLOGY or DESIGN OF STUDY

What do you intend to do and why! Talk about this chapter with committee frequently.

Introduction

- Remind the reader of your purpose and/or questions/hypotheses and give a brief introduction to this chapter.

Participants—very detailed complete description of who you are studying

1. Population/Subjects
   - Description of the group or individuals to be studied. Size, demographics, other characteristics/variables or traits that are related to the study
   - If qual study, DETAIL! Subjects and setting. Provide context of the people, places and activities. Timeframe as well.

2. Method of Selection of Sample/Subjects
   - Sampling design and rationale (positivist)—Use population and sample terminology
   - Subject selection rationale (constructivist)—Use participants for terminology
   - Who is your sample/participants and how did they get to be in the sample
   - Describe them relative to the population

3. Size, Demographics, Variables
   - Further description of the sample, population, etc.
   - How similar is the sample to the population (in detail)
   - Variables to be measured, studied (as related to the population and sample)

♦ NOTE: You may want to combine the above three sections into one section under Participants. Do whatever makes sense and is okay with your advisor, but be sure to give a complete description of who you are studied and how you selected them.

Instrumentation

1. Function of the instruments
   - What will the instruments do, what is their purpose, what does it measure

2. Validity and Reliability
   - Is your instrument valid and reliable? How was this determined?
   - Pilot study (prior to defense?)
   - Reliability is important when making decisions about individuals
3. Development
- Piloting
- Member checking, interview protocols, other
- How was the instrument developed and why was it developed that way?
- Use in pilot study, changes made
- Use the literature to back up the instrument pieces and their development

Research Design

1. Description and Rationale
- A description of your study’s research design and the rationale for this.
- This is kind of an overview your methodology and its rationale.
- If anything in the literature supports what you are doing (e.g., previous studies), mention it.

2. Data Collection Procedures
- Outline procedures for the collection of data—often in chronological order
- Mention letters giving you permission to collect the data and include them in the appendices.
- Indicate IRB approval of human subjects (when necessary), guarantees of confidentiality, anonymity, etc.
- Step by step chronological guide to how you will collect data—where, when, how, etc—This should be detailed!

3. Analysis Strategy
- Describe how the data analysis will be conducted
- Statistical tests to be used (quantitative)
  - For each test, there should be a null and alternative hypothesis that is related to a research question
  - Indicate alpha level of significance
- Peer audits, auditor, triangulation, theme development, etc (qualitative)
- Statistical procedures, assumptions, etc
- Appropriateness of your strategy
- Provide rationale for your strategy.
- Keep data for 4-5 years in case it is challenged
- Add headings as needed.

# 2 and 3 might be called data management and data collection for a more qualitative study.

Assumptions, Limitations, and Delimitations [of the methodology]
- Expand on those given in Chapter One and now focus on these relative to the methodology.
Summary

- Tell us what you just told us and transition into the next chapter.

- Remind people of your P-P-Q (Problem, Purpose, Question) in each chapter!
  Everything is linked to these!

Note: Items in bold are possible headings for the chapter (but should be done following APA guidelines). You should add your own headings as needed.
CHAPTER FOUR

RESULTS

This chapter deals with what you found and what it means with respect only to the people/subjects you studied. This is often a long chapter with detailed descriptions of the finding. “Just give me the facts, ma’am!”

Introduction

· Remind the reader of the purpose of the study (P-P-Q) and the methodology used.

Results of Data Analysis [description of results for each hypothesis, question, or measure]

· Describe what you found in your study using words, tables, graphs, etc.; whatever is appropriate.

[Numeric data: Tables, Graphs, Statistical Presentation]

· α levels and results/hypothesis and test

[Non-numeric data: Figures (objects), Narrative description using quotes and theme-ing]

· Explain key elements of tables and figures. Do not assume the reader understands what they are intended to show.

[Qualitative data: Themes you identified. Narrative description using quotes and theme-ing]

[Supplemental analysis (if there was any): Maybe you had an unexpected outcome and you did a follow up analysis or interview, etc.]

Add headings as needed to break up this section into logical parts and make it easier for the reader to find what he or she wants.

Discussion of the Meaning [results in terms of the participants and literature]

1. Relationship to Prior Research

· Compare what you found to previous research (that in your lit review)

2. Factors Influencing Outcomes

· Sometimes these are limitations and delimitations. It may be that you could not contact a person when you expected to be able to do this. Your response rate on a questionnaire is an uncontrolled factor. Refusal for an interview. Participant(s) leave the study and do not complete it. Etc.
More of what you did that weakened your data. You chose a small sample for some reason. You had a sensitive topic, and thus, responses may not be honest.

3. Resolution of Contradictions, Inconsistencies, and Misleading Elements in Findings
   • This section is probably not necessary, but if you had inconsistencies or contradictions in the findings, explain how you dealt with them.

Summary
   • Summarize your findings and transition the reader to Chapter Five where you will discuss the results in the context of the problem.

Note: Items in bold are suggested headings for the chapter. You should add your own headings as needed.
CHAPTER FIVE

SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter is written as if it could be pulled out and sent as a journal manuscript for submission. It is a short chapter and a summary and interpretation of what your study tells you about practice (and knowledge) relevant to the problem.

Introduction

- Briefly resummarize the PPQ, methodology, and findings or results. You may want a heading for each of these
- Be sure to include the answers to your questions
- Include corresponding conclusions you draw from interpretations of the results.
- Interpret each result—be careful not to extend beyond the findings—interact with the review of the literature

Discussion of the Broader Implications [of the findings]

- From your conclusions you imply (quantitative) or suggest (qualitative) implications for…
- Consider theoretical implications, practical implications, and limitations of the study.
- If you did a qualitative study, you might have generated a theory or model. This can go here as well.
- How does what you found impact knowledge and practice?

Recommendations

1. Procedural Adjustments
   - What would you do differently?

2. Replication [with another sample]
   - If someone were to replicate your study, what recommendations would you give them?

3. New [research] Question(s)

4. Suggestions for Further Study
5. Implementation of Findings
   - How could the findings be implemented? (Again, be careful about how far you go with this)
   - Practice—What could an organization do based on your findings?

Summary

Note: Items in bold are *suggested* headings for the chapter. You should add your own headings as needed.
The Thesis Process
Master of Arts in Teaching: Mathematics
as of June 6, 2005

The student who chooses the Math 599 Thesis option for the MAT: Mathematics degree should follow this procedure:


2. Choose a possible topic.

3. Choose a thesis advisor and committee, consulting with the MAT: Mathematics Program Director. The Director will generally honor the student request but will also consider faculty load in forming a committee.

4. Obtain and read a current copy of the MSU Thesis and Major Paper Guidelines. Your thesis must be written according to these guidelines.

5. Meet with the thesis advisor (in person, by phone or email) several times to reach agreement on the thesis proposal. The proposal will consist of
   - The first three chapters (Introduction, Review of Literature, Methodology or Design of Study) written or in rough draft form is required.
   - Introduction of the clear purpose/question that the thesis will address.
   - Enough literature background to justify the writing of a thesis on the proposed question.
   - Statement of methods to be used for any data collection and analysis.
   - Appendix items such as proposed survey forms or sample lessons.
   - A reference list.
   - Other information pertinent to a specific proposal.

6. Be sure all members of the committee have signed a thesis proposal form. Obtain a copy of that form. HAVE THE PROPOSAL APPROVED BY YOUR COMMITTEE PRIOR TO COLLECTION OF DATA, ETC.

7. Sign up (and pay tuition) for two semester hours of Math 599.

8. Prior to collecting data from human subjects, obtain approval from the Institutional Review Board (IRB). IRB information is available online at http://www.misu.nodak.edu/IRB

9. Frequently confer with your advisor throughout the data collection and writing processes. Your advisor will respond to your questions and rough drafts. If you fail to get a response, please send a reminder.

10. When you and your advisor believe the thesis is ready for defense, set a date of defense in consultation with your committee. Copies will be distributed to all committee members at least one week in advance of a date of defense.

11. At the defense you will be asked to give a short oral presentation of the research that you have completed. Your committee will then ask questions about your research and conclusions. (Bring a signature page printed on bond paper to the defense.)

12. After the defense, you will make any remaining corrections/additions/deletions in consultation with your advisor.

13. Consult with the Department secretary. Obtain directions for filing the thesis with the graduate school. Among other things, the graduate school must approve the formatting of your thesis (margins, etc.) before you print your thesis on good paper.
The Two Papers Process
Master of Arts in Teaching: Mathematics
as of June 6, 2005

The student who chooses the Math 598 Two Papers option for the MAT: Mathematics degree should follow this procedure:


2. Choose possible topics.

3. Choose a two paper advisor and committee, consulting with the MAT: Mathematics Program Director. The Director will generally honor the student request but will also consider faculty load in forming a committee.

4. Obtain and read a current copy of the MSU Thesis and Major Paper Guidelines. Your papers must be written according to these guidelines.

5. Meet with the two paper advisor (in person, by phone or email) several times to reach agreement on the papers. (The papers need not be done simultaneously. One paper proposal may be accepted and the paper written prior to doing the second proposal, if desired.) Each proposal will consist of
   - Introduction of the clear question/topic which the paper addresses.
   - Enough literature background to justify the writing of a paper on the proposed question/topic.
   - An outline defining the organization and content of the proposed paper.
   - A reference list.
   - Other information pertinent to a specific proposal.

6. Be sure all members of the committee have signed a paper proposal form. Obtain a copy of that form. HAVE EACH PROPOSAL APPROVED BY YOUR COMMITTEE PRIOR TO WRITING THAT PAPER.

7. Sign up (and pay tuition) for 2 semester hours of Math 598.

8. Frequently confer with your advisor throughout the writing processes. Your advisor will respond to your questions and rough drafts. If you fail to get a response, please send a reminder.

9. When you and your advisor believe both papers are ready for defense, set a date of defense in consultation with your committee. Copies will be distributed to all committee members at least one week in advance of a date of defense.

10. At the defense you will be asked to give a short oral presentation of the papers which you have completed. Your committee will then ask questions about your paper. (Bring a signature page printed on bond paper to the defense.)

11. After the defense, you will make any remaining corrections/additions/deletions in consultation with your advisor.

12. Consult with the Department secretary. Obtain directions for filing the two papers with the graduate school. Among other things, the graduate school must approve the formatting of your document (margins, etc.) before you print it on good paper.
SURVIVING, COMPLETING, AND DEFENDING THE THESIS

SURVIVING:
Develop a list of “why” and “why not” for doing the thesis. Develop and maintain contact with a support group: fellow thesis-ists (past and present). Keep in touch with your advisor: You must initiate this. Make a set of realistic expectations for your progress toward the goal. Balance your life as far as you can control that: family, work, faith, health, thesis.

COMPLETING:
Be Real—
- Narrow the P-P-Q to something meaningful you can do in a reasonable time.
- Count the cost: family, finances, friends, work, emotional, physical, etc.
Commit—
- After counting the cost, make the pledge you can.
Pace—
- “By the mile, it’s a trial. By the yard, it’s hard. By the inch, it’s a synch.”
- “Haste makes waste.”
- Think through the entire process, map it out, and set up reachable milestones.
- Do something thesis related every day.
- Chunk the work—Set aside large blocks of time to really saturate yourself in the work.
Accountability—
- Set deadlines and put them on your calendar.
- Ask to checked-up-on by the support group.
Emotion—
- Find the humor in this or it will kill you.
- Cry and/or in some other constructive way “blow off” the tension.
- Enjoy each milestone you reach.
- Plan to attend commencement and have a big graduation party.

DEFENDING:
Distribute (with advisor/chair approval) the final draft to all committee members. Have your advisor check on committee member concerns prior to the meeting—
- Prepare to address those concerns.
- Make changes in the thesis and distribute the drafted changes.
- Re-schedule the defense, if needed.
Prepare visual aids for a professional quality summary presentation. Practice you professional presentation for content and time. Re-read the thesis the day and night before. Dress in your best professional attire. Answer committee questions in concise and precise manner: expand as requested. This is literally a defense (not a celebration) of your expertise. Sometimes member will disagree with each other. This is an academic exercise. Stay out of their arguments and let your advisor/chair handle committee member disagreements. Watch your chair for cues: S/he is the facilitator, not you.