

Thesis Project Guidelines and Requirements

Thesis Committee

The first step in pursuing the thesis option is to file a student request “Form N” that switches the Academic Requirements report the thesis option.

Second, in consultation with your advisor, the members of the thesis committee must be selected and approved. The thesis committee consists of a minimum of three (maximum four) UNI Faculty members, at least two of which must be Science Education Faculty where one of them serves as the Chair of the committee and major research advisor. Additional members must be College of Humanities, Arts, and Sciences (CHAS) or College of Education (CE) faculty. The Chair of your committee must be a member of the Regular Graduate Faculty, but other members of the committee may be Associate Graduate Faculty. Your assigned faculty advisor may serve as the Thesis Committee Chair and act as your major research advisor, or if the area of research warrants, a new major advisor can be selected and become the Thesis Committee Chair. Committee members must be selected **before** the research project is designed and conducted and should be chosen with the assistance of your advisor.

Once the committee is selected, and the faculty members have been asked and agree to serve, the thesis committee approval form **must** be submitted to the Science Education Graduate Coordinator and Graduate College for approval.

The thesis committee assists the student in research design and in the writing of the thesis and ultimately has the final say on when it is acceptable for graduation. Please note that the expected turn-around time for feedback on drafts from your advisor and committee should be no less than two (2) weeks. Be sure to plan and communicate a proposed timeline with your advisor and committee to ensure timely completion of a quality project and paper.

Thesis Proposal

It is strongly recommended that SCI ED 6500 *Research Methods in Science Education* precede initiation of the research project. Before beginning the thesis research project, a formal written proposal of the study to be performed must be presented to the Thesis Committee. The proposal usually consists of the **Introduction**, **Literature Review** and proposed **Methodology** (Chapters 1-3, described below) of the final thesis. The Thesis Proposal paper is shared and then orally presented to the committee and **MUST BE ACCEPTED BEFORE** research starts.

Human Participants

Student research involving human participants must be conducted in compliance with the University policy for protection of human subjects. Students planning such projects must submit an application and gain approval for use of human participants in their project **before** beginning any research activities and data collection that involves human participants. Further information about regulations and completing a Human Subjects Review Form are available on the [IRB Website](#).

Thesis Components

Length and specific components of the science education master's thesis vary depending on the nature of the study. The following are suggestions intended to guide the student:

The Title: The best title for a thesis is one that indicates its content as precisely and briefly as possible.

The Abstract: The first element of a thesis document is the abstract, however it should be written last. The abstract should present an account of the thesis that will enable an interested person to determine the desirability of reading the entire work. It needs to be dense with information but also readable, well organized, brief, and self-contained. The maximum length of the abstract is 200 words.

Chapter 1 Introduction: This is an overview of the entire study and should address the following:

1. The framework/context for the research topic; and the problem or question being addressed (including hypotheses if statistical analysis is being used).
2. A brief synopsis of existing research/literature that addresses similar problems or questions and their shortcomings (a more thorough review should be saved for Chapter 2).
3. How the resolution of that problem or question will inform the practices or knowledge of other science education professionals.
4. An overview that clarifies the basis for conducting the study, the methods for executing the study, and the means by which results of the study may be analyzed and interpreted.

Chapter 2 Literature Review: This section explores the research literature that addresses the problem or question of the thesis. All dimensions of the question should be situated within the context of a theoretical framework around which other researchers have explored the question or some facet of the question. It should culminate in a summary that situates this study atop prior works—how it is intended to **advance** what we know about the problem or question, i.e., how it “**fills a gap**” in our knowledge base. Use **primary literature**, including the *Journal of Research in Science Teaching*, the *Journal of Science Teacher Education*, and others as

recommended by your advisor and discussed in SCI ED 6500 Research Methods in Science Education.

Chapter 3 Methodology: This section should thoroughly describe the data collection and analysis techniques used in developing an answer to the research question. Defend the chosen techniques by reference to prior studies (from the literature review) or by reference to appropriate research protocols designed for this type of study. Data collection and analysis methods (statistics or qualitative) must be defensible as valid and reliable by external standards and accepted practice in science education research.

Chapter 4 Results: This section presents the results of data collection through qualitative, quantitative, or mixed methods. Quantitative data should include tables, graphs, and figures where appropriate. Qualitative data should be logically organized and presented.

Chapter 5 Conclusion: This section is where the answer to the research question is directly addressed. Discuss your findings in the context of prior work established in the literature review. How do the outcomes of your study agree with, contradict, or in some other fashion merge with current thinking in science education? What explanations might be proffered for reconciling your study's insights with prevailing notions? Also address shortcomings of your study—potential sources of bias, flaws, or other identifiable shortcomings of the research study to which the reader should be advised. Finally, suggest future research options related to this study.

References: Be sure to include all references cited.

The finished thesis study should be of sufficient rigor and design quality for the development of a publishable manuscript in a science education research journal.

Required Paper Style

Specific requirements regarding the preparation and formatting of the thesis paper must follow the Graduate College Thesis and Dissertation Manual. Science Education uses American Psychological Association (APA), *Publication Manual*, 6th edition as a reference style; however, the Graduate College manual supersedes this style in certain instances (such as margins and headings). The format and style should follow the UNI Graduate College Thesis and Dissertation Manual first and then APA style.

A Thesis Preview appointment must be scheduled prior to the thesis presentation and serves as a way to ensure that the formatting of the Thesis and Dissertation Manual has been followed. Thesis previews can be conducted electronically over email and are initiated when a student indicates to the graduate coordinator their intent to finish in a given semester. From there, students will be contacted via their uni.edu email by the Thesis/Dissertation Reviewer so

schedule their preview. See the Thesis and Dissertation FAQs on the Graduate College Thesis and Dissertation webpage for additional information.

Thesis Presentation and Final Submission

Upon satisfactory completion of the thesis document, a public presentation must be conducted before officially submitting the thesis to the graduate college. The presentation should be ~45 min in length and summarize all elements of the thesis project. This presentation may be made in person on campus OR on-line video conferencing and should include an electronic slide presentation and time for questions.

The presentation can NOT occur before the thesis document is in its final (or second to last) edited form. The writing and editing process often takes several drafts (and several months) during which students will work mainly with the thesis committee chair but other committee members are available as additional resources.

Once approved, one (1) electronic copy and one (1) paper copy, printed on 24 pound white bond paper, 8½ x 11 inch, acid free, 25% or 100% cotton paper must be submitted to the graduate college. NOTE: [CopyWorks](#) in Cedar Falls_ will take orders online and deliver copies to campus if desired. If a hardbound copy of your thesis is desired by yourself or your advisor, additional paper copies can be mailed or delivered to the Science Education Office in McCollum Science Hall 153. These copies will be professionally bound and returned to students by Science Education free of charge.

SCI ED 6299 Research

The thesis option requires six (6) hours of SCI ED 6299 research credit. These six (6) hours may be taken in any combination at any time during the program, but should not be started until some direction in research has been determined by the student and the major advisor.

Learn more about the [requirements for SCI ED 6299 Research](#).