

## **Dissertation/Thesis Distinction Clarification**

The faculty of Exercise Science recognizes the hard work graduate students complete towards their degree. One of the most important features of the Masters or Ph.D. degrees is the research component. The faculty is responsible for grading the research process, which includes;

- 1) the development of the question/hypotheses
- 2) pilot testing
- 3) informed consent and human subjects research approval,
- 4) the proposal presentation
- 5) suitable methods/procedures
- 6) suitable statistics
- 7) subject recruitment
- 8) the quality of data collection,
- 9) the quality of the written dissertation
- 10) the final defense presentation of the thesis/dissertation
- 11) suitable and complete data presentation
- 12) suitable data interpretation, and
- 13) communication with committee.

Faculty must decide on how to grade to the candidate, which entails a decision on whether to fail, pass, or pass with distinction.

A large component of the grading decision comes from the chair of the dissertation. For example, the chair is the faculty member that worked the most with the student, and often had greatest time and opportunity to observe many aspects of the research process. Nevertheless, all faculty members must provide input on all aspects of the research, and the **awarding of a distinction** requires at least 3 favorable faculty votes.

Below are guides and explanations for how faculty is to consider each component of the research process.

### **The Development Of The Question/Hypotheses**

Often students work with their faculty mentor to develop the question. The faculty recognizes that the final research questions or hypotheses are likely to be a collaborative effort between the student and their mentor. However, faculty intentionally provides minimal assistance to the student for writing the hypotheses.

### **Pilot Testing**

Most, but not all research, requires extensive preliminary testing (pilot testing) to refine data collection procedures as well as data processing. The success or failure of a research project often rests on the quality of pilot testing. In addition, pilot testing provides data and objective answers to many questions that can be invaluable during the formal proposal of the research.

Where the faculty mentor needs to train the student on numerous procedures, there is obvious faculty input. However, the student is responsible for further pilot testing and the recognition of the time when procedures are adequately refined and mastered to allow official data collection.

### **Informed Consent And Human Subjects Research Approval**

This process is an invaluable experience for the student, and as such, is completed by the student. Where the faculty mentor has developed the research for the student, the faculty is the P.I.. However, when the student as develop his or her own research question, the student should complete and submit the informed consent submission with them as the P.I.

## **The Proposal**

This is to be a Power Point presentation to the entire dissertation committee. Masters thesis students do not need to complete a formal proposal.

The proposal should cover/include the following components.

- 1) Title
- 2) Background – brief review of research leading to the research question
- 3) Research Question(s)
- 4) Hypotheses and Rationale – provide a well-written hypothesis followed by a rationale for that hypothesis and the intended statistics. Repeat for all hypotheses.
- 5) Limitations – list and explain all threats to internal and external validity
- 6) Methods – detail all data collection procedures
- 7) Statistics – summarize what you have already presented on statistics
- 8) Anticipated Findings – try to present what you expect to find. Base these expectations on past research whenever possible.
- 9) Anticipated Contribution – explain how your anticipated findings will contribute to your field and the community at large.

## **Suitable Methods/Procedures**

The student is responsible for conducting background reading to ascertain the most valid methods of measurement, suitable for our laboratory facilities and equipment, for all dependent variables in the study. Prior data for validity and test-retest reliability for specific methods may be required. For many methods, the student may need to acquire this data as part of pilot testing.

## **Suitable Statistics**

Based on the importance of statistics in our Ph.D. curriculum and in the research process, the Ph.D. student is expected to be totally independent of outside help or assistance with statistics. As such, the student must understand and apply concepts of *apriori* power estimates in the proposal, and select and use the most suitable statistical procedures for analyzing data.

For the Masters thesis student, the study of statistics is not as advanced or thorough as for the Ph.D. candidate. As such, the student is not expected to totally master the statistical procedures, and is therefore more dependent on the mentor for assistance on this topic. Nevertheless, the student still needs to show some degree of competency in the research design and statistics used in the study.

## **Subject Recruitment**

The student is to organize all aspects of subject recruitment. This must be done in accord with human subjects research approval requirements.

## **The Quality Of Data Collection**

Data should be collected with minimal threats to internal and external validity.

## **The Quality Of The Written Dissertation**

The final product should be well written in regards to grammar and scientific accuracy.

## **The Final Defense Of The Thesis/Dissertation**

This is to be a Power Point presentation to the entire dissertation committee. Both Masters thesis and Ph.D. dissertation students are required to also complete a formal defense of the thesis.

The proposal should cover/include the following components.

- 1) Title
- 2) Background – brief review of research leading to the research question
- 3) Research Question(s)
- 4) Hypotheses and Rationale – provide a well-written hypothesis followed by a rationale for that hypothesis and the intended statistics. Repeat for all hypotheses. Make sure you cover all data that is to be collected, or at least relates to your research questions. In other words, ***do not provide a small number of hypotheses that represent a subset of the data you intend to collect.***
- 5) Limitations – list and explain all threats to internal and external validity
- 6) Methods – detail all data collection procedures
- 7) Statistics – summarize what you have already presented on statistics
- 8) Results – present all data that pertain to your hypotheses, as well as additional findings if they exist.
- 9) Discussion – explain your results in context to past research and the physiology that pertains to your topic.
- 10) Conclusions – summarize your main findings
- 11) Recommendations – provide applications of your findings, as well as advice for future research on yours and related topics.

### **Suitable And Complete Data Presentation**

During the preparation of the final written dissertation/thesis, as well as during the final defense of the dissertation/thesis, the student needs to have analyzed and presented all data collected in the research. This means that more than one manuscript may comprise chapter 3, and there may be additional data that need to be presented in this chapter. This requirement is necessary to prevent students from only writing a subset of their research in chapter 3, and also presenting such a subset during the defense.

### **Suitable Data Interpretation**

In both the written dissertation/thesis, and the oral defense, the student must adequately show that he or she understands the data from research methods and physiological perspectives. Such interpretations need to be compared to prior research findings and interpretations. Where there are differences in the results or interpretations, such differences need to be clearly identified and explained.

### **Communication With Committee**

During the course of the dissertation/thesis, the student must act professionally when interacting with committee members. Such interaction should be frequent so that all committee members are informed of the progress being made. Also, the student must provide hard or electronic copies of the dissertation/thesis chapters to the committee members with sufficient time (1-2 weeks) for the members to read and provide feedback to the student. This is especially important prior to the defense.

## The Decision On Distinction

The faculty of your committee will each have a form that identifies each phase of the research process. Each faculty is to rate your progress and performance on each item on a scale of 1 (poor) to 5 (Excellent). The committee members observe and discuss each other's scores, and when such scores are final, only those students who receive scores of 4 or higher on all items, from 3 or more committee members, will receive a distinction.

**Table: Items For Assessing Dissertation/Thesis Research**

Component	Scale					Comments
	<i>Poor</i> 1	2	<i>Average</i> 3	4	<i>Excellent</i> 5	
Questions/Hypotheses						
Pilot Testing						
Informed Consent						
Proposal presentation						
Suitable methods/procedures						
Suitable statistics						
Subject Recruitment						
Data collection						
Written dissertation						
Defense presentation						
Data presentation						
Data interpretation						
Communication with committee						