# D.Sc. Dissertation Guidelines

The objective of the D.Sc. dissertation is to assess the student's knowledge of information systems literature, particularly in their area of specialization and their ability to successfully conduct independent research in information systems.

The dissertation requirement will consist of the following components:

A. Dissertation proposal report and presentation
B. Final dissertation report and presentation

**Structure of the Dissertation Committee**

Students should form a dissertation committee as early on in the program as possible. Please refer to DSU policy http://www.departments.dsu.edu/hr/newsite/policies/054200-2.htm regarding detailed requirements of a dissertation committee. As part of the dissertation committee, the student must also select the dissertation chair or co-chairs, who will be the primary guide(s) during the dissertation process.

**General guidelines and requirements**

- A total of 25 dissertation credit hours are required for meeting the program requirements. Students may take dissertation credits anytime during their tenure as doctoral students with the approval of their academic advisor or dissertation committee chair. However, students should not exceed maximum credit hours per semester as outlined in DSU policy http://www.departments.dsu.edu/hr/newsite/policies/055000.htm.
- Students who have completed the 25 dissertation credit hours, but have not yet successfully defended their dissertation will need to register for additional dissertation credits every semester until they graduate.
- Upon forming the dissertation committee, the student must first work on formulating a dissertation proposal to be submitted and presented for approval as outlined in the Dissertation Proposal section in this document. See DSU Policy: http://www.departments.dsu.edu/hr/newsite/policies/054200-2.htm
- Students are expected to demonstrate the ability to conduct independent research during the dissertation process. This includes taking self-initiative in leveraging and carefully managing available resources such as library, committee members' knowledge and expertise, in addition to managing their own time and efforts.
- Students are responsible for managing the expectations of the dissertation committee members. To facilitate this process, it is suggested that the student take the initiative in developing and following a feasible and mutually agreed upon communication plan between himself/herself and the committee members. Depending on the role of the dissertation member, the communication plan may be unique for each member.
- Any student using human studies must clear their research through the Human Subjects Committee which performs the functions of the Institutional Review Board at Dakota State University. In addition, you must also take an online course on "Protecting Human Research Participants", available at http://phrp.nihtraining.com/users/login.php. This must be done before any data is collected. Failure to do this will have serious consequences including jeopardizing the student's degree. Please refer to DSU policy: http://www.departments.dsu.edu/hr/newsite/policies/048001.htm
- Students are encouraged to attend doctoral consortiums (at least one), in order to be able to present their research, gain feedback, interact with peers and faculty from other institutions, and gain some visibility. Most of the conferences in the field of IS conduct such consortiums.

- Students are required to ensure that their dissertation is free of grammatical errors and meets academic English language writing standards. See, for example, "Academic Writing for Graduate Students" (2004) by Swales and Feak.
- A generic guide to writing dissertations is available online at: http://www.usd.edu/edad/dissertation_guide.cfm
  This guide provides descriptive guidelines on writing social science oriented dissertations. A similar procedure may be adapted for design science oriented dissertations. The classic article by Hevner, March, Park, and Ram (2004) provides a framework for such research. Additionally, detailed guidelines and evaluation metrics for the dissertation are provided in the "D.Sc. Dissertation Guidelines" and "D.Sc. Dissertation Evaluation Guidelines" documents. Students should refer to these guidelines and evaluation metrics throughout the dissertation writing process. They should also consult with their dissertation committee to discuss how each of the main requirements can be met.

**Dissertation proposal report and presentation**

*Structure*
The dissertation proposal is an integral part of the overall dissertation process. It is expected that students begin working on their dissertation proposal early on in their tenure as doctoral students. Students should work closely with their dissertation committee chair and other committee members in formulating the dissertation proposal.

The dissertation proposal report should contain a detailed description of the specific dissertation project the student intends to undertake. The proposal should identify a significant problem in the field of research, clearly formulate the research question(s)/problem(s), summarize the current knowledge in the form of a thorough review of relevant literature, present proposed/developed IT artifact(s) (system design, research model, etc.), justify and explain the research methodology/validation mechanism to be adopted, describe the expected results and practical contributions, and clearly present the future research plan/steps and timeline.

The dissertation proposal report should not exceed 15 pages, and should meet the following formatting requirements: 1.5 line spacing, Times New Roman font, font size 12, APA style formatted references and citations.

While all proposal reports are expected to have an introduction and a literature review section, the rest of the sections may vary depending on the nature of your proposal and the requirements of your committee. For design science oriented dissertation proposals, the proposal report may consist of the following sections:

- Introduction
- Literature review
- Theory and artifact design
- Implementation and validation methods
- Expected results, contributions and discussion
- Future research plan and timeline

For social science oriented proposals, the proposal report may consist of the following sections:

- Introduction
- Literature review
- Proposed research model
- Research methodology/design
- Expected results, contributions and discussion

- Future research plan and timeline

The dissertation proposal presentation will consist of the student giving a 30 minute public presentation (briefing the dissertation proposal) to the dissertation committee, followed by 30 minute question-answer period (10 minute public QA+20 minute committee QA). The dissertation committee will ask questions during and/or after the student's presentation based on the dissertation proposal. Presentations would be conducted synchronously for both on-campus and off-campus students through use of appropriate distance learning technologies.

*Timeline*
Students may work on formulating the idea, writing the dissertation proposal, seeking and incorporating feedback from their dissertation committee members anytime during their tenure as doctoral students. However, students must propose a dissertation proposal defense date only after successfully completing all sections of the D.Sc. comprehensive exam. Students must submit their dissertation proposal report to their dissertation committee members at least 1 week prior to their proposed dissertation proposal presentation. Students are responsible to ensure availability of all committee members on the proposed proposal presentation (defense) date. A minimum of two weeks' notice is required.

*Evaluation*
The dissertation proposal (report and presentation) will be evaluated by the student's dissertation committee. Students will be given a pass/fail grade for these comprehensive exam components. Failing to successfully pass these components (with a maximum of 2 attempts per component) will result in not advancing towards the D.Sc. degree.

The dissertation proposal will be evaluated based on the following key criteria, in addition to the overall quality of writing and presentation.

- Problem statement
    - Is the problem statement clearly defined?
    - Is the research problem well motivated? Does the author include supporting data/references to show the importance of the problem?
    - Is the research problem interesting and current? Are there recent publications addressing the general research area?
- Literature review
    - Is the literature review comprehensive and complete?
    - Does it include obvious and highly relevant references?
    - Does the literature review include current and latest developments in the area?
    - Is the literature review well organized? Does the author use tables or other artifacts to categorize or summarize the literature review?
- Research Model / IT Artifact
    - Is the research model / IT artifact clearly articulated and described?
    - Does the research model / IT artifact have a sound theoretical base?
    - Is the research model / IT artifact logically derived from theory and past literature?
- Methodology
    - Is the methodology clearly described?
    - Does the methodology section includes details of experiment/survey design and instruments/case studies if employing quantitative and qualitative research methods?
    - Does the proposal include validation mechanism if employing design science research methods?

In addition to the above criteria, the dissertation proposal will be evaluation based on originality and impact. The following points[1] clarify the nature of an original contribution.

- Something that has not been done, found, known, proved, said, or seen before that results from:
    - Asking or identifying new questions, topics, or areas of exploration
    - Applying new ideas, methods, approaches, or analyses to an old question, problem, issue, idea, source, thinker, or text
    - Developing or applying new theories, theorems, theoretical descriptions, or theoretical frameworks
    - Inventing, developing, or applying new methods, approaches, computations, techniques, or technologies
    - Creating, finding, or using new data, data sets, archives, information, materials, or sources
    - Applying old ideas, methods, approaches, or analyses, to new data, material, or sources
    - Developing or applying new analyses, analytic approaches, frameworks, techniques, models, or statistical procedures
    - Coming up with new ideas, connections, inferences, insights, interpretations, observations, perspectives
    - Producing new conclusions, answers, findings, or proofs
    - Combining or synthesizing things (experiments, facts, knowledge, models of inquiry, problems, sources, technologies, theoretical constructs) from other fields or disciplines
- Is publishable
- Adds to knowledge
- Changes the way people think
- Moves the field forward/advances the state of the art

**Final Dissertation report and defense**

*Structure*

The final dissertation report and defense are the culmination of the student's research effort. The report serves as permanent record and documentation of the student's research effort while the proposal assesses the student's ability to present and defend their research contributions. Students should work closely with their dissertation committee chair and other committee members throughout the dissertation process.

The final dissertation report follows the general structure described earlier for the dissertation proposal report. In addition to providing a detailed description of the specific dissertation project (see proposal guidelines above), the final dissertation report include a detailed account of research findings, discussion of the findings, theoretical and practical contributions, and clearly present the future research plan/steps and timeline.

The final dissertation report has no page limit, and should meet the following formatting requirements: 1.5 line spacing, Times New Roman font, font size 12, APA style formatted references and citations.

The final dissertation defense is an open ended public presentation in which the student presents the findings of their research. The dissertation committee and the public may ask questions during and/or after the student's presentation based on the material presented and the final dissertation report. Presentations would be conducted synchronously for both on-campus and off-campus students through use of appropriate distance learning technologies.

[1] Adopted from Lovitts, B. E. (2007). Making the Implicit Explicit: Creating Performance Expectations for the Dissertation. Stylus Publishing, LLC., Virginia, USA. (pp.191-195).

*Timeline*

- Students should submit an "Application for Graduation" with the Office of Graduate Studies and Research by the census date of their intended graduation semester, as outlined in the DSU policy "Application for Graduation".
- The Dissertation committee requires four weeks to review the final draft. Within the four-week timeframe, committee members will submit comments to the candidate and notify the dissertation chair or co-chairs about the student's readiness to defend.
- The dissertation committee chair/s will work through comments with the candidate and inform the candidate of the readiness to defend.
- Once permission is provided, candidate needs to confirm a defense date (within 2 weeks after permission is given) and notify the Office of Graduate Studies and Research of the proposed final defense date. The final defense date must meet the deadlines for final defense date for the corresponding semester (10/31 for Fall semester, and 03/31 for Spring semester) set by the Office of Graduate Studies and Research. Students are responsible to ensure availability of all committee members on the proposed defense date. A minimum of two weeks' notice is required.
- Students must submit the approved dissertation to the Office of Graduate Studies and Research by the final dissertation submission deadline (11/30 for Fall semester, and 04/30 for Spring semester).
- Students must allow enough time for the dissertation review, revisions, and final defense scheduling during the semester they plan to graduate. It is recommended that they decide on a tentative dissertation defense date as early as possible in the semester they plan to graduate.

*Evaluation*

Following the public presentation, the dissertation committee will evaluate the dissertation based on the metrics/guidelines mentioned in the "D.Sc. Dissertation Evaluation Guidelines" section. Please refer to the guidelines below for using these evaluation metrics.

1. It is recommended that students use the following rubric throughout the dissertation process to help develop a dissertation of outstanding quality.
2. Note that not all the metrics mentioned in the rubric apply to every dissertation. The student, in consultation with the dissertation chair, should identify relevant metrics from the rubric to help guide evaluate and improve the quality of their dissertation.
3. Design science oriented dissertations use the format discussed in Table 1, while social science oriented dissertations should use the format discussed in Table 2.
4. For design science oriented dissertations, the theory section of the design science dissertation rubric evaluates the theoretical basis and design of the artifact, while the method section of the rubric evaluates the implementation and validation of the artifact. The results and analysis section evaluates the outcome and analysis of the IT artifact validation process.

**References**

Hevner, A. R., March, S. T., Park, J., & Ram, S. (2004). Design science in information systems research. *MIS Quarterly, 28*(1), 75-105.

# D.Sc. Dissertation Evaluation Guidelines[2]

**Table 1. The components of a design science oriented dissertation and their characteristics at different quality levels**

| Components | Quality Levels | | | |
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| | **Outstanding** | **Very Good** | **Acceptable** | **Unacceptable** |
| **Introduction** | • Well written<br>• Captivating<br>• Provides motivation and establishes the importance of the problem and places it in context<br>• Presents a very clear and concise statement of the problem, results, conclusions, and contributions.<br>• Lays out the plan for the dissertation | • Writing is good.<br>• Motivates the work but does it less well and is not captivating.<br>• Clearly describes what the problem is and why it is important.<br>• Starts with the big picture and narrows it down to the point being made.<br>• Indicates what the contributions are. | • Not well written.<br>• The ideas seem to be there.<br>• Is narrower in scope. | • Problem is not stated.<br>• Includes a lot of extraneous material |
| **Literature Review** | • Complete , comprehensive, up to date, organized, and coherent.<br>• Has nice logical structure.<br>• Provides a critical look at the problem<br>• Supports the statement of the problem and the statement of the contribution.<br>• Puts the work in context of what has been and being done.<br>• Shows a good understanding of the state of the art.<br>• Discriminates between important an un-important papers. | • Written at the appropriate level of depth with the appropriate amount of references | • Good enough.<br>• Pretty comprehensive, but may be missing a few important works.<br>• Shows that there are holes in the literature with respect to the problem. | • Inadequate or missing.<br>• Does not provide a context for or relate to what the student is doing.<br>• Omits a lot of important material.<br>• Cites work that the student has not read.<br>• Plagiarizes articles. |

[2] Adopted from Lovitts, B. E. (2007). Making the Implicit Explicit: Creating Performance Expectations for the Dissertation. Stylus Publishing, LLC., Virginia, USA. (pp.191-195).

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| | • Identifies gaps in the literature.<br>• States limitations of previous work.<br>• Simplifies and discusses very complex papers.<br>• Summarizes and ties together all the different methods people have been employing, using a common notion.<br>• Provides detailed examples of existing methods.<br>• Is a contribution in and of itself.<br>• Educates the reader | | | |
| **Theory** | • Creative, insightful, elegant, and significant,<br>• Conceived and presented logically and correctly.<br>• Takes theory beyond the literature.<br>• Develops a new theory.<br>• Is or provides mathematically correct foundation for the research. | • Appropriate, complete, and correct.<br>• Build on existing theory.<br>• Ties the project together.<br>• Defines where the theory works and where does it not. | • Presents a lot of theory that is never used.<br>• Assumes away all the difficulties. | • Omitted.<br>• Does not understand or justify the theory.<br>• Uses theory inappropriately. |
| **Methods** | • Provides a comprehensive description.<br>• Has a simple, complete, elegant approach.<br>• Exhausts all possibilities.<br>• Combines theory and methods.<br>• Has a balanced use of theory, experiments, and simulations.<br>• Uses existing theory to develop methods for useful applications.<br>• Seizes new tools and applies them to the problem.<br>• Demonstrates things through examples or simulations | • Compares chosen method against existing methods.<br>• Discusses its advantages and disadvantages.<br>• Identifies why the student chose the method.<br>• States all the assumptions.<br>• Indicates the range of parameters over which the method will work.<br>• Tests hypotheses | • Precise and complete enough so others can replicate.<br>• States what the student is trying to establish and how he or she will go about it.<br>• Sequential process-does all combinations randomly.<br>• May require major corrections. | • Shoddy.<br>• Lacks clear scientific deductive thinking.<br>• Does not identify what is being measured or why.<br>• Just a bunch of simulations.<br>• Makes improper generalizations. |

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| | | experimentally or with simulations | | |
| **Results/data analysis** | • Well written.<br>• Clear, simple, and appropriate presentation of unambiguous results, contributions, applications, limitations, and impact.<br>• Insightful.<br>• Very repeatable.<br>• Measurements have high degree of precision.<br>• Documentation supports the precision, accuracy, and reliability of the results.<br>• Has statistically and observably significant usable results.<br>• Results, including unexpected results, match or support the theory.<br>• Graphically displays carefully selected variables and results.<br>• Draws proper conclusions and makes proper inferences. | • Theory and results correspond.<br>• Provides an explanation for the correspondence | • Sufficient.<br>• Measurements, theory, and analysis align.<br>• Does not justify the claim it works better than something else.<br>• Needs major revisions | • Data are inaccurate, fudged, or falsified.<br>• Selectively presents only supporting data.<br>• Has lots of tables but no analysis or discussion of the contribution.<br>• Provides evidence that it works only one little narrow situation.<br>• Student does not understand the results.<br>• Draws conclusions based on very little data. |
| **Discussion and conclusion** | • Short summary that brings out major points and ties back to the introduction.<br>• Contains lucid insights.<br>• Places work within the context of the field.<br>• Identifies contributions and applications as well as limitations and shortcomings.<br>• Anticipates criticism.<br>• Discusses future directions | • Good summary of results.<br>• Clearly states contributions, possible applications, and future directions. | • Not well done.<br>• Provides some considerations for future work based on shortcomings of current work. | ---- |

**Table 2. The components of a social science oriented dissertation and their characteristics at different quality levels**

| Components | Quality Levels | | | |
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| | **Outstanding** | **Very Good** | **Acceptable** | **Unacceptable** |
| **Introduction** | • Short, focused, creative, and very synthetic.<br>• Has a hook.<br>• States the problem and shows why it is interesting and important.<br>• Explains the significance of the study.<br>• Introduces the literature review.<br>• Sets the context.<br>• Locates the project on what has been done before.<br>• Lays out a thesis and an organizational structure.<br>• Provides a preview and a road map of where the research is going and what is in the coming chapters | • Well written, but less eloquent.<br>• Poses a clear research question.<br>• Expresses clarity of purpose.<br>• Focuses on the key issues.<br>• Is good, solid but not surprising | • Workmanlike.<br>• Reasonably clear and focused.<br>• Has a marginal hook but is not exciting.<br>• Conveys what the research is about.<br>• Shows understanding of the topic.<br>• Provides an inking of the theoretical and methodological approach.<br>• May leave something out but does not say anything absolutely wrong. | • Nor grounded in anything.<br>• Very defensive.<br>• Tone is very politicized.<br>• Takes inappropriate stances.<br>• Goes off on incomprehensible tangents. |
| **Literature Review** | • Demonstrates a grounded understanding of the literature.<br>• Provides reasons for looking at the literature differently.<br>• Draws on literature in a convincing and supple way.<br>• Brings together and summarizes a broad body of material and makes meaningful distinctions without being exhaustive.<br>• Knows what needs to be cited and what | • Provides a meaningful summary of the literature.<br>• Includes both classic and recent citations.<br>• Is not a laundry list of "Smith said this" and "Jones said that"<br>• Demonstrates a nuanced understanding of the literature. | • Is ill conceived or seems wrong.<br>• Not analytical, integrated, or synthesized<br>• A stacked annotation, "This person said this" and "This person said that"<br>• Just regurgitates | • Omits people who have done the same thing the student is doing.<br>• Has not looked at commonly understood bodies of relevant literature.<br>• Cites articles that are out of date.<br>• Misinterprets the |

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| | does not.<br>• Analysis is organized around themes.<br>• Is succinct.<br>• Indicates the significance of the research | • Takes a body of the material and leans it toward a particular direction.<br>• Brings various intellectual resources to bear on the topic.<br>• Builds a case for the research and for the hypotheses. | material.<br>• Confusing.<br>• Not clear why some literature is being cited and other literature is not. | literature.<br>• Misquotes major theorists.<br>• Shows lack of understanding of the literature and where their research fits in the field. |
| **Theory** | • Provides a good , logical, sensible, coherent argument.<br>• Clearly indicates understanding of the major perspective.<br>• Shows up in the introduction, literature review, and in the substantive parts of the dissertation.<br>• Is in student's own language.<br>• Relates to other traditions and other ideas.<br>• Evaluates a specific problem through a theoretical lens.<br>• Evaluates different theories.<br>• Sees multiple levels and multiple relationships.<br>• Links observations to theory.<br>• Uses conceptual ideas in a creative way.<br>• Synthesizes theories.<br>• Develops or creates theories | ------ | • Is weakly understood.<br>• Does not specify assumptions.<br>• Shows slippage between the conceptual apparatus and the problem | • No theory.<br>• Completely unclear.<br>• Ideas, theory, and material are not aligned. |
| **Methods** | • Appropriate, clever, original, thorough.<br>• Very well done.<br>• Has basic validity.<br>• Exhibits good judgment about what needs to be said and what can go in an | • More workmanlike.<br>• Does not provide lengthy definitions of techniques already in the literature. | • Appropriate, competent.<br>• No fatal flaws.<br>• A rubber-stamped use of a textbook | • Fatally flawed.<br>• Mismatch between method and problem.<br>• Does not seem to understand the |

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| | appendix.<br>• Connects questions and theory with methods.<br>• Does something that ordinarily cannot be done.<br>• Uses a novel method or multiple methods (triangulation).<br>• Uses cutting-edge statistical techniques | • Use of a different technique might have been more appropriate or made it more interesting. | method.<br>• Appropriate foe the problem.<br>• Has basic validity.<br>• Sample is large enough but barely.<br>• Uses a very unusual group that does not represent the average.<br>• Yields a reasonably accurate answer.<br>• A different method might have been better | method.<br>• Uses method improperly.<br>• The operationalization is inappropriate.<br>• No clear relationships between hypotheses and variables.<br>• Variables do not capture the concept.<br>• No variance in one of the major variables.<br>• Measures are not valid or reliable.<br>• Statistical techniques are inappropriate or poorly explained. |
| **Results/data analysis** | • Appropriate.<br>• Uses advanced techniques.<br>• Interprets data properly.<br>• Sees complex patterns in the data.<br>• Does a high level, iterative analysis of the data.<br>• Uses tables, figures, charts, and maps to display the data cleverly.<br>• Makes clear links between the conceptual apparatus and results.<br>• Highlights the most important, original, and significant contributions.<br>• Goes beyond supporting the argument and disproves common theories | • Data rich<br>• Provides plausible arguments.<br>• Sees interrelations that are not obvious.<br>• Has rich illustrations. | • Analysis are well executed but not sophisticated or substantial.<br>• Data are not rich<br>• Does not have enough substance.<br>• Is not clear that the data are really evidence of the concepts.<br>• Findings are null.<br>• Provides too much information.<br>• Loses significant and important findings in the midst of endless | • Marginal analysis of the data.<br>• Student does not know why he or she uses the technique.<br>• Uses advanced technique but sees nothing in the data.<br>• Has obvious misinterpretations of the data.<br>• Shows every iteration of the model, but cannot discern what is important.<br>• Mindless presentation of the data without interpretation. |

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| | | | discussions of insignificant ones.<br>• Includes every regression equations. | • Uses graphic displays to create misleading perceptions.<br>• Evidence does not support the argument.<br>• Results do not follow from the analysis and are interpreted incorrectly.<br>• Oversells or over-generalizes the results. |
| **Discussion and conclusion** | • Briefly summarizes what was done and reaches into new areas and different ways of seeing things.<br>• Ties the whole study together.<br>• Shows that the questions, methods, analyses, and findings are consistent.<br>• Connects to the theoretical puzzles or debates they started with and takes them to another level.<br>• Underscores the findings.<br>• Discusses what is interesting and surprising about the results.<br>• Recognizes the study's strengths, weaknesses, and limitations.<br>• Sees the big picture significance of the work.<br>• Speculates on an provides an astute discussion of future directions.<br>• Has implications for the subfield, sociology, or social science. | • Discusses what is now known that was not known before.<br>• Shows the limits of the research.<br>• Indicates where future research might improve upon what was done.<br>• Proposes logical follow-on research.<br>• Focuses on very specific findings and neglects to bring out the general implications | • Restates what was already been said.<br>• Summarizes rather than analyzes.<br>• Overstates the results.<br>• Does not see or generalize the big picture.<br>• Indicates that further research is necessary but does not provide specifics. | • Just a summary<br>• No conclusions.<br>• Takes a section out of the introduction and puts it in the conclusion.<br>• Oversells the results. |