UNIVERSITY OF BORÅS
Department of Information Technology
Informatics

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To Perform a Degree Project within Informatics at the Department of Information Technology

Directions and advice

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PREFACE

These instructions have been developed in order to facilitate for the students to perform degree projects on bachelor, and master levels. The instructions cover the structure of the courses as well as formal issues. This document is a **supplement** to the current syllabus for the respective course.

The purpose with these instructions is to secure a good course process to facilitate the work with the degree project and through that contribute to a good quality of the work. Any questions that may arise about the instructions and the course should be directed to the course coordinator for project works within informatics:

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Good Luck!

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1 GENERAL THOUGHTS ABOUT DEGREE PROJECTS WITHIN INFORMATICS AT THE DEPARTMENT OF INFORMATION TECHNOLOGY

A degree project within Informatics at the Department of Information Technology is an independent scientific work that the student performs at the end of his or her education. The project is performed on bachelor or master levels. The work will result in a monograph that is called thesis. It is important to realize that the degree project is a *course*, that the students will acquire knowledge during the project similarly to other courses.

The degree project thus has a double function: to present a scientific knowledge contribution as well as demonstrate the learning that has occurred during the course when the students have developed their scientific ability. The bachelor thesis can here be seen as the first step to develop this ability where certain limited knowledge can be obtained. The scientific ability that is acquired in that way can then be used and developed further during a 15 hp master thesis and later during a 30 hp master thesis.

In order to be allowed to start the degree project the student must have passed relevant courses proceeding the project. Formal requirements are stated in the syllabus for the respective degree project.

Degree projects are always performed in groups, usually of two students. The topic for the work should be suggested by the students and be approved before the work may begin. This proposal occurs in connection with a thesis registration for the work being submitted. The thesis registration is usually submitted in January/February or September/October. This registration initiates the department to appoint a supervisor for the student group. Supervisors are usually appointed in February or October. With the support of the appointed supervisor, the student group then creates a planning report that controls the degree project. The planning report is usually finished during February or October. The degree project on bachelor level as well as the master degree 15 hp project consists of 10 weeks of full time independent work whereas the 30 hp master degree project covers 20 weeks of full time independent work. All degree project courses are usually given during the spring semester where the main part of the degree projects on bachelor and 15 hp master levels are performed, starting in the beginning of April and finishing in the end of May. The 30 hp master projects are performed from the end of January until the end of May. A course is also given during the fall, starting in the beginning of November and finishing in the end of January.

The degree project ends with an examination that consists of several phases. The most important phase is the students independent research work tutored by a supervisor assigned by the Department of Information Technology. The end phase of the course is triggered by a final seminar with presentation, defence and review. The group will after the seminar receive comments that should facilitate the group to make the final push in completing the thesis. The thesis is finally submitted to an examiner who will evaluate and review it concerning plagiarism and cheating.

The finished thesis is then published through BADA/DiVA, the system for scientific publications at the University of Borås. The examination of degree projects on all levels are generally performed in the beginning of June or in the end of January. Additional seminars may be arranged in August and January if there is a sufficient demand for a seminar. The tutors' assignment is terminated in January or August one year after the course has started. The group has the right to be examined five times on the course.

Please observe that the common purpose of degree projects regardless of level is to develop and demonstrate an ability for independent knowledge development within the area of Informatics. This means that the student must create new and generally interesting knowledge within the subject area. It is also important that the student applies a critical attitude towards scientific works. The result from the degree project will be documented in a monographic report called thesis that may be written in Swedish as well as in English. Regardless of level the thesis must possess a high degree of communicability, be carefully designed and well written. The line of argument (the congruence requirement) must be present in thesis on all levels. The student must already on the bachelor level learn to write in a way the traceability is maintained and communicability is promoted. The student will then further develop this ability through thesis work on higher levels.

Thus there are several similarities between thesis on different levels but also differences. Degree projects on bachelor level imply a special training to methodologically perform a study within the frame of a knowledge development. The examiner will therefore put a special emphasis on reviewing the ability to design a scientifically established mode of operation and how this mode of operation has been implemented during the project. For a thesis on bachelor level the *methodological* ability is focused, that is the students should achieve an ability to work according to scientific methodology. The knowledge contribution is therefore of less importance than for master thesis and the bachelor thesis may therefore discuss problems where the question of relevance is given less importance than for master thesis. There must however exist relevant motives for the chosen research questions for all types of thesis since the argumentation for the chosen questions may be considered to be part of the methodological ability.

As a consequence of the methodological focus the demands of creativity and scientific establishment are not as important for a bachelor thesis as for thesis on master level. It is also not possible to expect that the argumentation for general knowledge can be as powerful for a bachelor thesis as for a thesis on master level. The requirements for originality and clearness of one's own knowledge contribution are however equally important for all levels. It is important that the students can learn to differ between the statements of their own and others already on bachelor level and that they don't plagiarize the texts of other authors.

The requirement for review and to argue for different theoretical sources is weaker for a bachelor thesis than for thesis on master level. The requirement for cumulative knowledge is greater for master thesis than for bachelor thesis but also the latter type of thesis must of course relate the presentation to earlier knowledge.

For 30 hp master thesis the same requirements are valid as for 15 hp master thesis, but on this level the degree project is more expansive and the students are evaluated on the size of the study as well as the depth of the analysis and innovativeness of the knowledge creation. All these parts are expected to be larger in a 30 hp master thesis than in a 15 hp master thesis. This requires an extended substance in the theoretical as well as the empirical part of the research.

In spite of the differences there are many similarities between thesis on different levels. Degree projects often take their starting-point from a rather wide basis. For the work to become manageable it is however necessary in these cases to narrow the area essentially during the performance and focus on a few questions that illuminate a limited area of research. To achieve this there is a successive narrowing of the problem area. At analysis and discussion it is then necessary to insert the results in a larger context and expand the studied area to cover a wider focus. Finally a feedback to the implications of the result to the problem-area is done in the conclusions in order to relate back to the starting-points of the work. This procedure may be shown through the following figure.

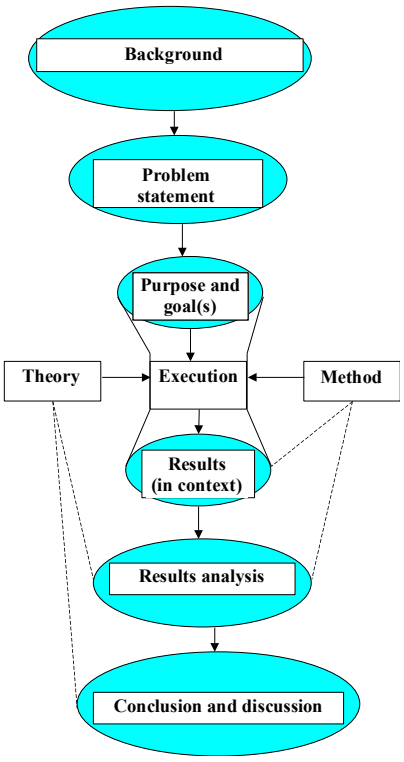

Figure 1: An illustration of the focused degree project.

2 THE DIFFERENT STAGES OF THE COURSE PROCESS

The degree project regardless of level follows a syllabus and is thus organized as a course. The course process pursue the following common stages:

- Degree project introduction
- Information meeting / course kick-off
- Registration for the degree project
- Supervisor assignment
- Planning report
- Supervision and seminars
- Final seminar with presentation, defence and review
- Examiner evaluation and grading
- Submission of the finished script for publication

Below follows a description of the different stages.

2.1 DEGREE PROJECT INTRODUCTION

During this stage the groups that will start their degree project will be introduced to start and perform a degree project within Informatics. The introduction is presented in writing and in good time before the performance of the course in order to give the students ample time to reflect around the choice of topic, the starting procedure, etc. During this initial stage the students are given an orientation about which documents are necessary to read to start the process. The information is distributed via mail and is also posted and is given in Swedish as well as in English.

N.B.! The degree project is usually introduced during December for thesis work in spring or during September for thesis work in fall.

2.2 INFORMATION MEETING / COURSE KICK-OFF

At this meeting the course is presented and the instructions for the degree project are communicated as well as current time schedules, conditions for supervision and what happens if the student doesn't finish the thesis in time according to plan or if the student fail the examination. The information meeting is held in Swedish as well as in English and is performed in the study period before the degree project to allow the students early planning and an early start of the project.

N.B.! The information meeting for the degree project is usually held during January (for spring) or in September (for fall).

2.3 REGISTRATION FOR THE DEGREE PROJECT

To qualify for supervisor assignment the student must register for the degree project. The registration should be sent through the electronic form available for thesis work on the home page of the School of Business and IT. It should among other things include information about

- group members (degree projects are always written in groups, usually with two students)
- a preliminary title of the thesis
- a short description/problem argumentation
- a time plan

N.B.! All students who want to perform their work during the period indicated in the course syllabus must supply a registration for the degree project no later than the specified deadline for registration. The deadline for registration is usually in the end of January respective middle of October.

2.4 SUPERVISOR ASSIGNMENT

As soon as an approved registration has been received by the school, it is possible to assign supervisors. This will take place as soon as possible after deadline.

The assignment is performed by the Informatics teaching staff based on the resources that are available for supervision. Since it is necessary to get an impression of the whole picture of the situation it is necessary that all registrations meet the deadline. Late registrations will therefore not be considered! Registrations that do not reach a sufficient level or do not contain enough substance will be resubmitted to the students for refinement.

In the case of shortage of supervisor resources the registrations will be given priority where the students according to the course syllabus are planned to perform their degree project during the period in question. If the student is refused supervisor assignment due to shortage of supervisor resources, the student may apply for a supervisor by submitting a new registration the next time that the course is given.

The result of the supervisor assignment is sent out to the students via mail.

The supervisor commitment reaches from the assignment at most up until two study periods after the time for the final seminar according to the course syllabus.

N.B.! Supervisor assignment usually takes place in the beginning of February (spring) or end of October (fall).

2.5 PLANNING REPORT

It is important that the students design a planning report that controls the degree project. The work to design the report starts as soon as possible after the supervisor assignment. The students are responsible to initiate and pursue the creation of the planning report. The starting point is that the planning report will develop the problem statement in the degree project registration to a theory based target image for the project as well as a work schedule for the performance of the work. The planning report usually consists of the following parts:

- The background to the work
- A list of relevant literature
- Problem statement
- Research questions and purpose
- Expected result
- Intended target group for the result
- Possible limitations

- Thesis outline as planned
- Method design, including
    - Scientific perspective
    - Research strategy
    - A description of the research process
    - Design of methods for collection of data, analysis of data and evaluation
    - Activity and time plan for the degree project

It is not uncommon that the size of the planning report consists of 15-25 pages. A good working model is also that the planning report will evolve to become introductory parts of the thesis. The planning report should be used as a basis to organize the supervision of the work. It is appropriate that the supervisor and the students direct the initial part of the supervision to finish the planning report and then use it as a guide to organize the succeeding work.

There is a close relation between the course in scientific method and the performance of the bachelor degree project. During the different parts of the method course, different scientific conditions are problematized in order to implement different types of knowledge developments. The students can then relate this problem discussion to their current degree project.

N.B.! The planning report usually finds its shape in the end of February (spring) or October (fall) and is then further developed as a consequence of progress of the degree project.

2.6 SUPERVISION AND SEMINARS

The basic purpose of the supervision is to satisfy the students' demand of guidance for the choice of topic, scientific method and the organization of the work. The supervision may also include support to reach a good quality of the work and that it may result in a scientifically solid thesis that gives a good description of the project. The supervisor will also assist the students to develop their scientific ability and critical reflection. The supervision should mainly be based on a planning report and later on the evolving thesis.

Supervisor assistance may primarily be expected on the following aspects:

- topic delimitation
- estimate if the choice of subject may lead to a thesis
- the wording of research questions
- to help the student out of impossible side tracks
- to promote the scientific development of the student
- to produce ideas and serve as a catalyst during the degree project
- to supply advice about an appropriate scientific method for the work to progress
- ideas for theories and relevant literature to study
- enthuse the students to overcome difficulties during the work
- the presentation of results and conclusions
- review and evaluate thesis drafts and final text several times

- references
- formalities and general practicalities

This means that the student must primarily himself or herself account for the necessary subject knowledge. The supervision may be differently designed dependent on the needs of the students and the character of the degree project. The supervision may be given individually or at seminars. The supervisor should assist and support the independent work, but it is the responsibility of the students to by themselves secure the progress of the process.

N.B.! It is important to make use of the supervisor during the entire work, not only at the end. Contact the supervisor immediately if you get stuck and feel that you can't progress.

2.7 FINAL SEMINAR WITH PRESENTATION, DEFENCE AND REVIEW

A degree project in Informatics is examined through a number of steps. At the final seminar the preliminary script of the thesis will be evaluated, presented and defended. A final seminar is thus an occasion for a scientific dialogue concerning a degree project that is about to be completed. A final seminar thus gives different people a possibility to discuss their own and other peoples' works. It is therefore seen as self-evident that the students participate in the arranged final seminars.

A preliminary final script should be submitted no later than 5 days before the final seminar. A preliminary script consists of a complete thesis that may however be modified through the instructions for correction which will be provided by the seminar leader after the final seminar. The instructions aim to support the group to push the thesis to a satisfactory level before it is submitted by the examiner for final examination. The preliminary final script must follow the directions for thesis within Informatics at the school of Business and Informatics. (These are available at websites about Thesis work in Informatics at the School of Business and IT) The submission of the thesis is done by printing the preliminary final script and submitting it in the thesis box in the light yard. This action means that the examination of the thesis has formally started.

Apart from submitting the preliminary final script in the thesis box in the light yard, the script should also be sent to the student group that will present the review of the thesis during the final seminar. It is the responsibility of the students to secure that this group also get a copy of the script. In what way this is done is up to the students. The script should be sent on the same day as the information about the seminar agenda is sent to the student groups, usually 4 days before the final seminar.

During the final seminar the work is presented and the review group presents their review according to the following guidelines:

1. The authors start with adjustments of possible errors in the thesis. This should

only cover errors that are of importance for the content of the thesis (that is not spelling errors). Possible spelling errors and other adjustments may be distributed to the auditorium on a written list of errors.
2. The authors continue by presenting a summary of the thesis.
3. After the authors' presentation the review group will present their opinion of the thesis and the authors get an opportunity to defend the thesis. During this stage the discussion only takes place between the reviewers and the respondents.
4. In the final stage there is an opportunity for the seminar leader, supervisor and the audience for questions and for discussion of the content of the thesis.

In connection with the final seminar the reviewers must submit a written review to the authors, the supervisor and the seminar leader.

Time-frame:

Stage	**Maximal amount of time**
1+2	20 min
3	15 min
4	15 min

It is important that the time-frames are kept.

The seminar leader will after the seminar compose a written evaluation of the report and also instructions to the authors how they can improve the thesis and make it ready for examination. In the written evaluation it should be stated:

1. which adjustments that the group should perform in order to complete the final script of the thesis
2. a recommendation from the seminar leader when the group should submit the thesis to the examiner
3. who the examiner will be for the thesis (can be sent later)
4. if available, the deadline for the submission of the final script

If the thesis needs adjustments these instructions is included in the seminar leaders evaluation. The group have then until deadline to complete the thesis and submit it for evaluation. Information how to submit the thesis to the examiner is provided to the group.

If the seminar leader in his/her evaluate reach the conclusion that the thesis is not ready for examination during the next set of examinations then the thesis has weaknesses that probably will lead to that the thesis will fail during the examination. The seminar leader should then provide a indication what the group should improve and when the thesis ought to be ready for examination.

2.8 EXAMINER EVALUATION AND GRADING

In the written evaluation from the final seminar it is stated who the examiner of the thesis should be and contact information to the examiner. No later than the

deadline stated should submission of the final script of the thesis be done. The examiner should then read and evaluate the thesis.

The final grade of the course is made up through a combination of

- The degree project of the students; see further below *Criteria for evaluation of degree projects within Informatics at the Department of Information Technology.*
- The defence of the students' thesis; the ability to defend their own thesis is a self-evident component of the total review of the degree project.
- The review performed on the thesis of a colleague; also the quality of the review is a component for the evaluation of the course as a whole.
- Review of the thesis through an application to trace plagiarism.

The examiner should consult the tutor and the seminar leader of the final seminar before grading the thesis. The examiner will decide the grade and inform the group about the grade.

2.8.1 If the group pass the examination

For a final examination to occur and to make it possible to register the grade in LADOK the following criteria must be satisfied:

- The students have got information from your supervisor and your examiner that your thesis is ready for final submission and that you have got a thesis number.
- The students have submitted the thesis in pdf-format via an electronic form.
- The thesis has passed the review concerning plagiarism and cheating.
- The examiner has submitted a grading form to the thesis administration.

When the thesis is considered ready for final submission by the examiner, the students submit the finished final script by loading it into a special electronic form that can be found on the websites about Thesis work in Informatics at the school of Business and IT. The thesis is reviewed by the tool that after that sends the thesis together with an analysis report to the examiner. The examiner will review the report and only after that the proper examination takes place. The examiner then submits a grading form to the thesis administrator. After that the thesis grade is registered in LADOK.

The application for review concerning plagiarism is a tool for ransacking whole texts. The tool looks for similar or identical texts on the Internet and in exclusive databases. The application for a review of plagiarism can among other things be used to find material that has been inappropriately used in degree projects, thesis or other submitted papers. The storage of your thesis in the application for review of plagiarism requires your permission and this also means that plagiarism of your own thesis can be traced.

2.8.2 If the group do not pass the examination

It is not unusually that groups fail the thesis examination. A failure means that the thesis must be improved and examined again. A new examination can at the earliest be done in the next set of examinations arranged after the examination in which the thesis failed. The group should until then improve the quality of the thesis. Instructions for what this means for the specific thesis will be provided by the examiner. If the failure is the result of plagiarism then specific rules apply.

The group should after the failure inform the thesis coordinator that the revision work have begun and provide a plan when the group aim to submit a new revised thesis for a new examination. The thesis coordinator will then keep track of the thesis group and when the number of examinations have been consumed then the coordinator will terminate the group from the thesis course. Each group have the right to five examinations, of which three should be provided within one year after the course started. Tutoring after a failure is only admitted if the tutor assignment is still valid.

3 CRITERIA FOR EVALUATION OF DEGREE PROJECTS WITHIN INFORMATICS AT THE DEPARTMENT OF INFORMATION TECHNOLGY

There are some basic requirements that are valid for all types of theses. These are discussed below. The basic requirements are:

- Relevance concerning choice and treatment of the topic
- Originality and clearness in one's own knowledge contribution
- Creativity concerning knowledge contribution and the treatment of the topic
- Scientific basis concerning a relevant link to theory and research
- Generality concerning the value outside the study
- Congruence concerning the coherence of different parts
- Method concerning choice and argumentation
- Method concerning performance, that is the implementation of the method
- Communicability concerning clearness of the structure of the theses and language accuracy
- Cumulativity concerning the ability to relate to previous knowledge

3.1 RELEVANCE CONCERNING CHOICE AND TREATMENT OF THE TOPIC

The relevance is directly connected to the research questions. There must be a good argumentation that the current study possesses a good *scientific* and *pragmatic* relevance. Different theses can emphasize these aspects in different ways. In some theses the emphasis is on the scientific relevance whereas other theses put a greater emphasis on the pragmatic relevance. The discussion of relevance is about presenting good reasons to perform the current research.

Suitable questions to put in connection with the test of relevance:

- Do we move within informatics? Is there a bearing towards our focus IT and its use?
- Is the knowledge useful for somebody?
- Is there a convincing argumentation for the delimitation?
- Is there a convincing argumentation for the research questions and the purpose?
- Are the included subject areas treated with an acceptable depth?
- Is there a clear justification and argumentation for how different knowledge areas contribute to the field of Informatics?

3.2 ORIGINALITY AND CLEARNESS IN ONE'S OWN KNOWLEDGE CONTRIBUTION

An academic thesis should produce new knowledge. It must therefore be clear throughout the thesis what is the contribution of the authors and what has been retrieved from other sources. Thus there must be originality in the thesis, that is the new knowledge should be produced by the authors.

Suitable questions to put in connection with this requirement:
- Is the knowledge contribution the authors' own or is it plagiarism?
- Is the knowledge contribution clearly defined?
- Does the knowledge contribution fulfill the intentions according to the research questions and the purpose?

3.3 CREATIVITY CONCERNING KNOWLEDGE CONTRIBUTION AND THE TREATMENT OF THE TOPIC

It is important that the topic that the thesis treats has been chosen concerning what may be regarded as important to study within the research area. This topic should then be treated so that new thoughts and ideas can emerge in an efficient way. The newly produced knowledge should also form a basis for further research.

Suitable questions to put in connection with the evaluation of creativity:
- Is it possible to use the knowledge contribution for further research?
- Has the chosen method been used creatively?
- Have the authors made a creative choice of topic?
- Have the authors treated the topic creatively?

3.4 SCIENTIFIC BASIS CONCERNING A RELEVANT LINK TO THEORY AND RESEARCH

The knowledge must also have a good basis in earlier theory and research. Through that a high credibility for the result is created. The argumentation should always take its starting point from the character of the knowledge that the research produces. Different knowledge character, as for example explanatory knowledge, comprehension knowledge or normative knowledge puts different demands on the scientific basis.

Suitable questions to put in connection with this requirement:

- How does the work connect to theory and previous research?
- Is there a theoretical background that indicates which scientific area supports the work as a theoretical base?

3.5 GENERALITY CONCERNING THE VALUE OUTSIDE THE STUDY

Generality can often be a problematic requirement within the area of Informatics. Because of the great complexity and richness in diversification that is characteristic for our empirical field, it is in most cases difficult to argue for an absolute generality of deterministic-scientific character. The generality that is an important requirement of research within our area is rather of *analytical* character than statistical. To reach an analytical generality, the knowledge contribution should be given an abstract form that reaches beyond the studied cases. Thus it is important that the authors present arguments that although the knowledge contribution has extracted from a limited theoretical study and an empirical survey that cover only a few cases, the results can have a value outside the study. The knowledge should thus be possible to extend to other contexts.

Suitable questions to put in connection with the evaluation of generality:

- Is there a discussion about and argumentation for generality?
- EMPIRY: Is there a value outside the studied context?
- THEORY: Is there a connection to the theories that have been used?

3.6 CONGRUENCE CONCERNING THE COHERENCE OF DIFFERENT PARTS (LINE OF ARGUMENT)

Congruence means that the thesis should constitute a coherent wholeness. The reader must perceive that different parts of the theses have been brought together to a common coherent argumentation. The research questions, the choice of method, the theoretical basis, the possible empirical survey, results and conclusions should form an argumentative wholeness.

Suitable questions to put in connection with the evaluation of congruence:

- Is there a clear connection between problem-method-theory-empiry-result and conclusion?

3.7 METHOD CONCERNING CHOICE, ARGUMENTATION AND IMPLEMENTATION

The argumentation for the choice of method should be based on the character of the need for knowledge. It is important that all types of method (data collection, analysis, presentation and evaluation method) are covered. The methods that have been presented in the method chapter will then be used at the implementation of the different phases that the methods cover. It is necessary to articulate the difficult question of sampling when it comes to the choice of text for a theoretical basis as well as for the choice of empirical objects.

Suitable questions to put in connection with this requirement:

- Have the knowledge needs been characterized?
- Is there a clear knowledge strategy motivated from the character of the knowledge needs?
- Have data collection been chosen and argued for from the knowledge strategy and the character of the knowledge needs?
- Have methods for analysis been chosen and argued for from the knowledge strategy and the character of the knowledge needs?
- Has the study been performed according to the chosen method?
- Communicability concerning clearness of the structure of the thesis and language accuracy

3.8 COMMUNICABILITY CONCERNING CLEARNESS OF THE THESIS STRUCTURE AND LANGUAGE ACCURACY

Communicability is an important requirement. It is necessary to explain and define the concepts that are used in the thesis. Also concepts that may appear self-evident may sometimes be necessary to explain for the reader to get a clear picture of how the authors perceive the concept in question. The language should be easy to read without losing accuracy. It is important to keep the text concise. A too voluminous thesis looses in communicability only through its volume. Unnecessary repetitions must be avoided but this must not lead to the loss of the line of argument.

Suitable questions to put in connection with the evaluation of communicability:

- Is it possible to follow a line of argument throughout the thesis?
- Are the parts of the thesis placed correctly?
- Is the role of the theoretical study clear?
- Is the role of the empirical survey clear?
- Do the authors follow the methodological choices?
- Is the source of different statements clear?
- Is the language overall understandable and correct?
- Is the language clear?

3.9 CUMULATIVITY CONCERNING THE ABILITY TO RELATE TO PREVIOUS KNOWLEDGE

Cumulativity means that the thesis constitutes a part of the ongoing research within the area. It is therefore necessary that the authors relate their own research to the works of others. This means to recognize as well as critically evaluate the work of other researchers – that is decide what to use as a basis for further knowledge creation and what is rejected.

Suitable questions to put in connection with this requirement:

- Does the thesis relate to earlier knowledge?
- What is the attitude of the authors to the knowledge that they relate to?

- Is there a discussion about the generality of the knowledge contribution?
- Is there a discussion about further research related to the knowledge contribution?