

## MSc Research Skills

### Lecture: ITC MSc thesis procedures

D G Rossiter

University of Twente.

Faculty of Geo-information Science & Earth Observation (ITC)

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UT/ITC Enschede

### ITC MSc thesis procedures

ITC has defined procedures for stages of the MSc thesis process:

1. Research proposal
2. Midterm examination
3. MSc thesis assessment

**Official study regulations** on Intranet:

<http://intranet.itc.nl/education/staff/regulations/studyregulations.aspx>

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UT/ITC Enschede

### Topic: The thesis process

1. The thesis research proposal
2. Supervision
3. Effective time management
4. Data management and backups
5. Problems

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UT/ITC Enschede

### Research proposal

- A written document, about eight pages;
- Research problem, objectives, questions and work plan;
- If appropriate: study area, novelty, data sources
- Submitted for review and grading;
- Defended in an open **oral exam**;
- Basis of **Go – no go** decision (admission or not to **thesis phase**).

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UT/ITC Enschede

### Purpose of a research proposal

It must convince the research sponsor (e.g. UT/ITC) that the researcher:

- knows the previous work on a subject,
- and has a **workable plan** on how to go beyond it.

The reviewer should be able to read a proposal and be taken along a path from:

- a **research problem** (what is not known) ...
- ... supported by a **literature review** that shows that there is really a problem that has not been solved ...
- ... to **research objectives** and then ...
- a sound **research methodology**, also backed up by literature.

### Supervision

**The contents of the thesis are the responsibility of the candidate**, not UT/ITC, nor the Course, nor the supervisor.

The **student**:

1. designs the thesis project;
  - within the context of the research project (e.g., linked PhD research, ongoing ITC research)
  - the general outline is defined by ITC but elaborated and operationalized by the student
2. collects the data (if applicable);
3. performs the analysis or builds a system or model;
4. writes the thesis; and
5. defends it.

### Role of the supervisor

The supervisor is more properly called an **advisor** or **coach**:

- Orient the research (e.g., within context of ongoing research);
  - Critically examine student's **ideas**;
  - Read the student's **writing** (proposal and draft) and suggesting improvements;
    - \* some editing, **not rewriting**
  - Suggest key **references** or **literature search strategies**;
  - Give ideas for promising research **directions**;
- (continued ...)

- Keep student clear of known **dead ends** or poor methods;
- Advise on **priorities** and **time management**;
- Communicate lack of progress / possibility of failure to Course Director and student.

Supervisors are **not co-authors** of the thesis.

## Who are the supervisors?

- Supervisors are appointed by UT/ITC from its **research staff** according to the research topic.
- In **joint educational programmes** (JEP) another first supervisor is appointed from the **partner institution's** staff, and is primarily responsible for local supervision.
- A second supervisor may be assigned in case of:
  - \* absence of first supervisor on mission;
  - \* special expertise of second supervisor.
- Other staff, including PhD candidates, may be involved in the research project (e.g. in joint fieldwork) but are not supervisors.
- In appropriate cases a supervisor is invited from outside UT/ITC, for example a researcher at an partner institution.

## Supervision intensity

- The student can expect **an average of two hours per week** in the **thesis execution phase**. This includes face-to-face meetings, but also the time that the supervisor needs to read drafts, check calculations, check literature, etc.
- Time spent in **fieldwork** is included in this average.
- During the **proposal writing phase** the supervision time will be somewhat more.

## Supervision method

There is no uniform style, but in general:

- Student and supervisor meet in **regularly-scheduled** meetings, with an agreed agenda set for the next meeting;  
(So, the student can not expect *ad hoc* assistance)
- The meetings are minuted and the Course Director is informed of the **progress**;
- Written work** must be returned to the student, with comments, within **ten days** (UT/ITC regulation) but usually within a week.

## Problems between student and supervisor

Problems can best be avoided by **open communication** between student and supervisor.

But if there still seems to be a problem, Regulations 5.3.4 states:

"If an MSc participant considers that he/she is not receiving the quality of supervision required in the regulations, the participant should **report this to the Course Director**."

Course director will solve the problem with his/her best judgement.

## Time management

- **The work must fit the time available**, design it accordingly – time can not be expanded but work can be reduced;
  - The **quantity** of work is not as important as its **quality**;
  - **Set priorities**;
  - **Work smart**: Before undertaking tedious calculations or samplings, be sure you are calculating or sampling the right thing;
  - Do the **simple** things before moving to the **complicated** ones.
  - **Plan ahead**: Make a work plan and stick to it;
- (continued ...)

## Time management (2/2)

- **Be realistic** in your time planning.
  - \* A human being is not a machine;
  - \* Budget for personal and work-related setbacks.
- Do **creative work** at the times you work best; save routine tasks for other times;
- Take time to relax and re-focus your energy;
- Don't waste time writing things that are not central to your own research.
- Keep a **log book** of your work.
- Leave time to **check and revise** your work.
- **Do not let problems sit!**

## Data and file management

- **Organize** your digital files logically, and **document** this organization.
- Each directory or file should have sufficient **metadata**, most conveniently in a text file:
  - \* What does it contain?
  - \* How was it produced?
  - \* Who produced it?
  - \* What is its format?

## Backups

**Back up your computer files** at regular intervals; there are many possibilities and no excuses:

- Material stored on the **UT/ITC file servers** (M: drive) are backed up every night by the IT department.
- There are many low-cost or free file servers on the internet, so that your work is saved in more than one **physical location**.
- Burn a CD, write to external storage (disc or flash drive), or place all data in the "cloud" at least once a week.
- Especially, make several archival copies of your **primary data** as soon as possible. Store this away from your primary computer.

Keep copies of each thesis draft; you may want to go back to (parts of) a previous **version**.

## Final thoughts

- UT/ITC provides the **facilities** (library, field, computer, data, lab ...)
- UT/ITC provides experienced and competent **supervisors**
- But, at the end, it's **your** research and **your** thesis
- So that you will be a **qualified junior researcher**.

## Topic: Research proposal

Recall: the **purpose** of the MSc research proposal is to:

- **convince** the research sponsor that you know the previous work on a subject;
- and that you have a **workable plan** on how to go beyond it and **contribute** to science via research.

A reviewer should be taken along a path from:

- a **research problem** (what is not known);
- supported by a **literature review** that shows that there is really a problem that has not been solved;
- to **research objectives**
- and then a sound **research methodology**, also backed up by literature.

## Proposal procedure

- Several weeks to prepare, meet with a **coach** (who may later be the supervisor)
- The student presents the **written proposal** (about eight pages) to a Thesis Admission Committee
- The student presents the proposal **orally** in a **qualifying examination**, and answers (pointed) questions about it.
- The committee consists of the research theme leader or delegate, and the first and second supervisors or their delegate(s).

## Proposal evaluation

The proposal is judged on two counts:

1. Does this candidate have the **ability** to conduct MSc research and write a thesis about it?, assuming that the candidate will receive a normal amount of supervision? This is evidenced by the candidate's ability to prepare a proper proposal and the response to questions.
2. Is the proposed research **feasible** within the time allocated, and given the resources (secondary data, field support, ...) available?

## Proposal results

- The committee decides **whether the student can continue with the MSc thesis phase**, or if their study must be terminated.
- The committee can also give comments on an unsatisfactory proposal, and give a second opportunity to defend a **revised proposal** within two weeks.
- In case the second proposal presentation is not satisfactory, the candidate will not be admitted to the individual research period, and leave UT/ITC with a **certificate of attendance** and their course record.

## Topic: Midterm examination

About half-way through the thesis phase of the MSc is the **midterm examination**, to:

- Review **progress**, compare with **plan**;
- Identify research **objectives** and **questions** that are no longer feasible;
- Identify **new** research **objectives** and **questions** that can be met with the data in hand;
- Identify any **difficulties** that might prevent the timely **completion** of the thesis project.

This is a key moment to evaluate progress so far and plan for a successful conclusion of the thesis project.

## Preparing for the midterm

1. Convert the **research proposal** into **MSc thesis** format.
  - Use ITC thesis **document style** (Word,  $\text{\LaTeX}$ ) or other consistent style which meets specifications;
  - **Introduction** and **Literature review** may need updating but format should not need to change;
  - Change **verb tenses** as necessary: "will" → "were" etc.
  - Begin **glossary** and/or **list of abbreviations** if needed
  - Add placeholder chapters on **results, discussion, conclusion** (or per-topic)
  - Remove **expected outputs**, these will be in the results

(continued ...)

## Preparing for the midterm – continued

2. Review (and then rewrite) the **objectives** and **questions** to see:
  - If they can still be answered with data in hand;
  - If not, these should be **removed**;
  - If they should be **revised, deleted, or sharpened**;
  - If **new** objectives and questions can now be met.

(continued ...)

### Preparing for the midterm – continued

#### 3. Rethink the **title**

- Does it now reflect your (new, revised, updated) main objectives and results?
- Can it be made more attention-grabbing or descriptive?

(continued ...)

### Preparing for the midterm – continued

#### 4. Rewrite the **Methods** chapter or section, reflecting what was actually done.

- It must be clear what you actually did;
- It should be possible for someone else to **verify or duplicate** the work from your description (including references);
- This includes a thorough description of any **secondary data**.

(continued ...)

### Preparing for the midterm – continued

#### 5. Begin the **Results** chapter(s), showing analysis so far.

- At least thorough **description** and **summary** of the **primary data** actually collected
- Preliminary results and their **interpretation**
- This allows **planning** of further analysis

(continued ...)

### Preparing for the midterm – concluded

#### 6. Prepare (and **practice**) a brief **presentation** of these points.

- Highlight what was actually done
- Explain what could not be done as planned
  - \* *"Explain, never apologize"*
- Show fieldwork (photos; maps)
- Show preliminary results
- Present proposed revisions to objectives and questions
- Discuss difficulties and your proposed solutions
- Present plan for the remaining time

[End]

### Midterm procedure

- Candidate gives a brief **presentation**:
  - \* **Original** problem, objectives and questions
  - \* **Progress** (data collected, analysis, ...)
  - \* Preliminary **results**
  - \* **Revision** of objectives and questions (if necessary)
  - \* **Plan** for finishing the thesis
- Committee discusses the presentation and asks questions

No grade is given; the candidate receives **comments** and **suggestions**.

**Clear problem cases** are referred to the Course Director.

### Topic: MSc thesis assessment

Study regulations on the ITC intranet:

<http://intranet.itc.nl/education/staff/regulations/studyregulations.aspx>

An ITC thesis is judged by a **Thesis Assessment Board** (TAB)

### Thesis submission

- The thesis document is submitted  $\approx$  two weeks before the defence (submission date specified by the Course Director)
- If the supervisor believes that the thesis is not satisfactory, s/he must inform both the Course Director and student before submission
- The student can still choose to defend the thesis, the supervisor is only one member of the TAB

### Extensions

Postponement of the submission date of the thesis can be given when:

1. The **main cause** of the unsatisfactory level of the thesis has been **beyond the control of the participant**;
2. The extension could lead to an acceptable thesis and examination;
3. **Financing** for the extension is available;
4. The request is made **before the thesis is submitted**.

The participant must take the initiative to **apply in writing** to the Course Director.

Extensions are **not** given for slow progress, student inability, problems that should have been foreseen by the participant, poor time management, or personal time off for travel.



## Composition of the Thesis Assessment Board

For degrees conferred at UT/ITC:

1. An **ITC professor or associate professor** in a relevant discipline (who cannot be one of the supervisors);
2. An **external examiner**, either from outside ITC (usually an academic staff member of a university or a knowledge institute) or from a scientific department of ITC that has not played a major role in the course and research theme;
3. The thesis **supervisor(s)**;
4. Depending on the specialized knowledge required to fairly judge the thesis, there may also be other UT/ITC scientific workers specialized in those aspects of the thesis;

(continued ...)

...

Generally the (Associate) Professor chairs the examination.

Two other people may attend the exam in a formal capacity, but not as voting members:

- The UT/ITC **Course Director** (or representative) to ensure proper procedures;
- A **PhD advisor**, who may be asked to question the candidate.

## Examination result

Possible decisions by TAB:

1. The thesis is **satisfactory**. One single mark is given.
2. Subject to **minor corrections** that can be implemented within **three working days** the thesis is satisfactory. One single mark is given, once corrected.
3. The written thesis is **not satisfactory** and a FAIL grade is given. However, the presentation and defence have shown that the participant is capable of performing principal research tasks. Subject to **major changes**, the participant may re-submit the written work within **three months** for a new assessment.
4. The thesis is **not satisfactory** and is given the FAIL grade.

Option (3) **no ITC supervision** is provided; *not* an extension of the study period.

## Elements of the mark

The mark for a satisfactory thesis is combined from three elements:

1. the **written thesis**;
2. the **oral defense** of the thesis contents;
3. assessment of the **learning process**.

Of these the written thesis receives by far the highest weight.

## Grading scale

100 **“Perfect”**: outstanding innovation, superb writing and interpretation, no more could be expected in an MSc thesis period

90, 95 **or** 100 **Excellent**: publication quality, no flaws, quite innovative, could easily be adapted as a journal article or a chapter in a PhD thesis;

80 **or** 85 **Very Good**; well above expectations, only minor flaws, innovative, research has no serious questions and can be incorporated into a journal article;

70 **or** 75 **Good**; meets expectations of a typical work within the time allowed and with the facilities available; nothing special but nothing really bad;

60 **or** 65 **Pass**: meets minimum standards, passing; not innovative, serious flaws;

**no mark Fail**: does not meet minimum standards.

## Subjectivity

The interpretation of terms such as ‘good’, ‘well above expectation’ etc. is **completely up to the discretion of the Board**.

However there is some more detailed description (see next slides).

Most Boards give points in steps of 5, e.g. 75 for a thesis which is not “outstanding” but has features that make it more than simply “good”.

## Evaluation criteria

Exam committees follow the “Instructions for Thesis Assessment Board” approved by the ITC Examination Board in September 2011; the criteria are detailed on the following slides.

However, the grade is **holistic** summary of the thesis, not the sum of points from the checklist.

## Criterion 1 – Scientific scope and depth

**The research addresses a well-formulated relevant problem of sufficient scope and depth linked to relevant literature.**

- Is the research **problem** clearly defined? (E.g. through well formulated research questions).
- Is a **relevant** research problem being addressed?
- Has the research problem been placed in the **context** of the scientific field concerned?
- Is there a critical discussion of and link to relevant **contemporary literature**?
- Is the research undertaken of sufficient **scope and depth**?
- Is there evidence of a thorough **understanding and mastering** of the subject and discipline?
- Is there an **innovative** part in the research?

### Criterion 2 – Scientific method

**The research is undertaken with a clear and transparent methodology with proper use of concepts, methods and techniques.**

- Were the research methods appropriate to answer research questions (conceptualization and operationalisation of the research questions)
- Is the research process and methodology clearly described and well structured?
- Are the methods and techniques for data collection and analysis properly selected and applied?
- Was the data collection and analysis performed using the correct methods and with proper reference to literature?
- Have the objectives been reached and/or are research questions answered?
- Are conclusions drawn correctly after analysis of data?
- Are the conclusions and statements supported by evidence?
- Is there a critical discussion and reflection on the research findings and awareness of the limitations of the research?

### Criterion 3 – Reporting

**The thesis is a well structured and readable, with a clear layout.**

- Is the thesis well and clearly written?
- Is the thesis well structured
- Is the thesis logically written?
- Is proper use made of literature references, and was proper referencing applied?
- Has effective use been made of visualization tools like maps, tables and graphics?

### Criterion 4 – Presentation and defense

**The research is well presented, followed by a discussion with proper argumentation.**

- Did the presentation provide a clear and concise summary of the research?
- Was the candidate capable to respond adequately to questions, criticisms and comments?
- Did the candidate make proper use of the thesis during the defense?

### Criterion 5 – Process

**The candidate worked in a structured and rather independent way, while making adequate use of the guidance of the supervisor.**

- Does the thesis reflect the candidates' own research ideas and efforts?
- Was the research planned and undertaken in an independent and structured way?
- Did the candidate take initiatives?
- Was there a good communication between the candidate and the supervisors/staff?

The supervisor(s) inform the committee of their assessment of these points.

## Preparing for the thesis defence

- **Know your thesis** – where to find everything which might be discussed.
- Prepare (and **practice**) a brief (8–10 minute) **presentation** of these points:
  - \* The research problem and questions
  - \* The methods applied
  - \* The principal results
  - \* The principal conclusions
- Recall – the committee has read the thesis, this is not a general lecture; so the presentation is just to orient the defence.
- You may choose to have some **hidden slides** to show if they are helpful to answer questions – examples: maps, figures and tables.

## During the thesis defence

- Listen carefully and answer the questions directly and to-the-point.
- Only answer what was asked.
- It's a scientific discussion, so you are free to disagree with an examiner – but make sure you can back up your statement with a result from your thesis or literature cited in it.
- If you don't know something – say so.

And ... **enjoy your big day!**