

# Master Thesis Manual For Human-Technology Interaction (HTI)

*Document version: September 2013*

*(update second and third assessor April 2018)*

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## 1. Introduction

In this text, we summarize the process of the Master Thesis Project (MTP) for Human-Technology Interaction (HTI). This serves as a guideline for students and mentors/supervisors. Also, in this text the evaluation criteria for the Master Thesis are defined.

The content of this document is an addition to the official regulations (the '*Education and Examination Regulations*', the '*Examination Rules and Procedures*' and the '*Graduation Regulations*' of both Programs). In case of doubt, the official regulations will prevail.

The MTP is the final project in the master program; the student should have completed in principle all other courses before starting this final project. Since it is a full time project of one whole semester (30 ects), it is formally planned in the last (fourth) semester of the master program.

## 2. Master Thesis forms and preparation

In order to monitor the stages in the graduation process, several administrative forms are used (e.g. *Electives Form*, *MTP Contract Form*, *Start MTP Form*, *Research Proposal form*, *End MTP Form*). These forms can be downloaded from educational portal page <http://onderwijs.ieis.tue.nl/>, under the topic 'Master thesis manual and forms'.

The student can start the MTP only after formal approval of the Examinations Committee. For that, the student has to apply to the IE&IS Education Office to obtain a '*Start MTP Certificate*', that is to be passed by the secretary of the Examinations Committee. This certificate will only be granted if all other units of the master's degree program have been completed (with the exception that a maximum of 10 credits still may be open, the program unit 'Research Project' (HTI) not included<sup>1</sup>). In the HTI program, the student must complete the course 'Research Project', in which the student passes the complete empirical research cycle in a research project from the domain of HTI, resulting in a research report.

After acquiring the Start MTP certificate the student can begin with the Master Thesis Project. The first activity of the student in the MTP is to develop a research proposal that will be part of the MTP contract. The first supervisor decides whether the proposed research in principle meets the program criteria. In the 'MTP Contract' the constitution of the Assessment Committee (including the first and second supervisor), the subject of the MTP and the time schedule, are laid down. The *Research Proposal* and the MTP Contract have to be signed by the first supervisor and the student, and has to be handed by the first supervisor to the Examinations Committee for approval, within one month after the start of the MTP. Rejection of the proposal by the Examinations Committee must be substantiated. In case of rejection an adapted proposal has to be submitted to the Examinations Committee.

## 3. Master Thesis Project

The Master Thesis Project has the following requirements:

1. Topic and methodology should be within the domain and capabilities of the first supervisor.
2. The research proposal meets accepted international research standards. This is secured by the fact that the first supervisor must be a qualified mentor in the master program in question, preferably approved by the research school that is linked to the master program.
3. The design orientation of the thesis is ensured. This implies that the project should not only result into an analysis, but also into a theoretical or applied design to address the problems identified in the analysis.
4. The size and depth of the project is such that it can be completed to a "pass" grade ( $\geq 6$ ) by an average successful student of the program within a period of 21 weeks (net), with a study load of 840 hours.

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<sup>1</sup> As from HTI generation 2011 the HTI Research Project in that case should be completed for at least 70%.

5. The motivation, embedding, and conclusions of the thesis proposal should not only take into account the detailed research focus of the thesis, but should cover a wider area of the research school involved.

A student which has been allowed to take Master courses without having been formally admitted to the program, is not allowed to start with the Master Thesis project before formally having been admitted to the Program.

During the main trajectory the student is working full-time on his/her Master thesis. The first supervisor and student keep in close contact.

#### **4. Master Thesis (report) formal requirements**

The Master thesis must be self-contained and include (relevant extractions of) the research proposal. The thesis must meet specific formatting requirements defined by the Program Director (see appendix). In addition to writing a Master Thesis report, the student should also make a 'press release', according to the guidelines in the 'Press release manual' that can be downloaded from <http://education.icis.tue.nl>, see the topic 'Thesis Manual and Forms'.

#### **5. Master Thesis Examination**

After completion of the thesis, the student submits the thesis to the first supervisor and the second assessor. After both supervisors have approved the Master Thesis, a date is set for the final examination. At least ten working days shall pass between the formal approval of the Master Thesis and the final examination. The Examinations Committee is informed immediately after the date and time has been set, at least ten working days before the oral exam. There should also be at least ten working days between this exam and the scheduled meeting of the Examinations Committee. The final examination consists of:

1. An oral presentation by the student, with a maximum of 45 minutes, of the methodology and main results of the project.
2. An oral exam, in which the student is questioned on his project and thesis. The supervisors may invite other people to take part in the oral examination.

The *oral presentation* is public. However, it is an examination and as such the result is not known in advance. The graduate must be warned in advance that it is not a foregone conclusion that he/she will pass the examination. Before the meeting, the first supervisor must determine what the committee's assessment is of the work that has been delivered. If necessary the first supervisor must point out possible problems to the committee and the graduate. The assessment committee will grade the student according to the evaluation criteria defined in section II. The final grade is awarded as follows:

- 4 or 5 insufficient
- 6 just sufficient
- 7 adequate (what can be expected)
- 8 good (well above what can be expected)
- 9 excellent (student clearly develops new insights and contributes to theory explicitly)
- 10 perfect

The questioning of the graduate (not public) is a real examination, in which the assessment committee tests the graduate. The result and the explanation thereof are discussed with the graduate in a closed session.

The assessment committee determines the grade of the Master Thesis project. If the grade is 6 or higher, the student is passed, provided that the additional requirements as specified in section II are met.

If the student does not pass, the assessment committee may decide to:

- either give the student the opportunity to improve the Master Thesis work, and decide on a second oral exam, which should take place within two months after the initial oral exam, or
- discontinue the project and fail the student. In this case, the Examinations Committee decides whether the student receives the right on mentorship during the writing of a new thesis, should the student decide to do this.

The Examinations Committee regularly checks the assessments of the Master Thesis projects. This can be done both randomly and targeted (*e.g.*, for very high or low grades).

## **6. Responsibilities of the first supervisor**

### **6.1. Preliminary activities**

An intended first supervisor has to undertake some preliminary activities in preparation for the thesis projects that will be assigned to him/her. A potential first supervisor ought to have contacts in order to advise potential graduates in choosing a field site. A mentor can use his/her own network or ask colleagues for contacts. It is also possible that the student has/searches for a company or another kind of external organization. This should however be done in close cooperation with the mentor in order to guarantee a sufficient thesis subject.

At the very end of the project, the first supervisor will hand over the diploma to the graduate in the diploma award session in the Auditorium. It is handy for the mentor to take notes during the project about the way things are going and how the graduate performed. This makes it easier to write a short speech for the award ceremony

### **6.2. Supervisor-student relation**

When assigned to a student, the first supervisor is responsible for:

- assisting the student with developing a thesis topic;
- approving the research proposal of the student, which must be completed before the start of his/her main thesis project.

In general the first supervisor serves as a role-model of a researcher for students. He/she accompanies the student in selecting a good research question. Being a role-model means that the personal and professional behaviours of faculty members should be the standard that the student will emulate. Students' attitudes towards the discipline and the academy are conditioned by examples provided by mentors in graduate school.

In general the first thesis supervisor is the person who supervises the student's research. It is the first supervisor's responsibility that a thesis project meets all the necessary conditions:

- The quality of the thesis project meets international research standards. This is secured by the fact that the mentor is a member of a research school.
- The design orientation of the thesis is ensured.
- The project meets the standards of the department concerning its size and depth and continues to do so throughout the length of the project.
- The throughput time the Master thesis is not exceeded.
- After consultation with the graduate student, the first supervisor ensures the timely appointment of a second supervisor.
- The first supervisor assesses the thesis and the reports related to it.
- The first supervisor ensures that the graduate takes responsibility for his work and agreements.

The first supervisor is responsible for daily guidance and supervision, including formulating the project assignment and holding progress meetings. The first supervisor ensures that the student maintains progress in the project, and conducts all reasonable efforts necessary for the student to complete his/her project on time

In case of a thesis project in an organization, the first supervisor is responsible for:

- The organization in which the project is being carried out demonstrates sufficient involvement; a capable company supervisor spends enough time and puts enough energy into the project, there is a clear problem area for the project, and the management of the company is interested in the project as such.
- The situation within the company for the graduation project offers sufficient opportunity for the successful completion of the project (reorganizations for example can lead to unworkable situations).

The thesis project itself is the responsibility of the graduate. In other words, the graduate must design and control the planning of the project and also draw up agendas and write up reports on discussions, meetings, and agreements. He/she must be aware of all the department's regulations and procedures regarding graduation projects and must apply them.

Student supervision and guidance will cost approximately 70 hours for the first supervisor (including thesis preparation).

If the first supervisor is unable to fulfill his task within a specific project, the chairman of the subdepartment to which the supervisor belongs, is responsible to resolve this.

## **7. Responsibilities of the student**

It should remain clear at all times that the project is the responsibility of the student. In other words, the student always maintains final responsibility for the proposal, the project, and the thesis. He/she must design and control the planning of the project and also draw up agendas and write up reports on discussions, meetings, and agreements.

It is the student's responsibility to be acquainted with all relevant regulations and procedures regarding the project, and it is the student's responsibility to apply them.

## **8. The MSc Thesis Assessment Committee**

The mentor (1<sup>st</sup> thesis supervisor) of the graduate student takes the initiative to form the MSc Thesis Assessment Committee (3 weeks before signing and submitting form 4 'End Master Thesis Project'). The MSc Thesis Assessment Committee consists of three adherents (the mentor, the 2<sup>nd</sup> supervisor and the assessor). The members of the committee are selected conform the criteria with regard to the authorizations to evaluate examinations, as determined by the Exam Committee.

The tasks and responsibilities in the MSc Thesis Assessment Committee are:

- a) The first member of the MSc Thesis Assessment Committee is the supervising mentor who is qualified by the Exam Committee and acts as the first assessor;
- b) The second MSc supervisor can be from any research chair and acts as second assessor;
- c) The third assessor is a staff-member (never a PhD student) and is from the same research group as the student being assessed or from another research group and knowledgeable;
- d) The third assessor's tasks are, in the following order, to read the thesis and to participate in the thesis assessment at the defence.

The role of the third assessor is to assure the quality of the grading process. The third assessor does not participate in thesis supervision, which is reserved for the first supervisor (who is also the first assessor) and the second supervisor (who is also the second assessor). We also note

that all thesis assessors are required to have the knowledge involved in assessing a thesis and thus are in a position to assure the quality of the grading process.

## 9. Evaluation criteria for the Master Thesis Project

The master thesis project will be evaluated on the following criteria. The assessment committee rates each of the seven criteria on the following scale: 'insufficient – sufficient – good – excellent'. The candidate passes if a maximum of one criterion is marked as insufficient, with the exception of criteria (b), (c) and (d), which should always be marked 'sufficient' at least.

The committee then assigns a final grade to the master thesis project between 1 and 10 (half grades are allowed, e.g. 6.5 or 7.5).

- Excellent (9 = top 10%): The thesis shows deep understanding of the topic, a substantial degree of creative engagement; faultless exposition, is clearly structured around a central thesis, and has clear signs of independent thought.
- Good pass (8): Very clear and accurate exposition, good understanding of topic, structured around a central thesis, signs of independent thought.
- Sufficient (7 or 6): Reasonably clear and accurate exposition, structured around a central thesis, adequate grasp of topic, transcending the course materials. Exhibits rather basic, but still acceptable, level of relevant knowledge and understanding. Faults in exposition may to some extent be compensated for by evidence of independent thought.
- Insufficient (< 6): Fails to make low pass grade because of insufficiency in one or more of the criteria.

### The seven criteria on which the master student is evaluated on are:

#### a) *Competence in scientific discipline*

The graduate has demonstrated competence in *his/her scientific discipline*, in terms of knowledge and insights, state-of-the-art literature, and theories and models in the domain of Human–Technology Interaction / Innovation Sciences.

#### b) *Competence in doing research*

The graduate is able to organize a research process, i.e. independently produce and execute a research plan consisting of a coherent description of the relevant literature, research questions, and appropriate research methodology.

#### c) *Scientific attitude*

The graduate is able to:

- analyse problems of a more complex nature in a systematic and scientific manner;
- critically reflect on existing theories, models, interpretations, and his/her own assumptions and findings;
- make an original contribution to the debate in the area of his or her thesis subject .

#### d) *Basic intellectual skills*

The graduate is able to reflect critically, to reason logically, to ask adequate questions, and to form and motivate a personal opinion and standpoint.

#### e) *Engage with design*

The graduate is able to

- engage in technological design on a product, organisational, or societal scale;
- formulate recommendations on technological innovations or innovation processes based on an integration of technology and social science analyses.

#### f) *Competence in cooperation and communication*

The graduate is able to:

- operate effectively and efficiently in a multidisciplinary context;

- communicate clearly and unambiguously, in writing and verbally, in (inter)national environments, in industry and in academia, with non- specialists and specialists in the domain;
- communicate in a proactive and balanced way with supervisors;
- accurately describe the methods used and document the research results correctly.

g) *Awareness of the temporal and societal context*

The graduate is able to:

- frame the research question and findings in their particular historical and societal context;
- reflect on the societal effects of applying scientific results in relevant fields.

The assessment committee gives a final grade to the Master Thesis project between 1 and 10 (in half grades).

## 10. Appendix 1: Master Thesis (report) formal requirements

The final report must fulfill the following requirements:

- Maximum of 60 pages (main text)
- The report is written in English.
- A digital version of the graduation report must be delivered to the secretary of the Examinations Committee, at least five working days before the Examinations Committee's final examination meeting for which the student has put his/her name forward.
- The Master thesis is public and will be digitally published by the library. If the organization in which the graduation phase has taken place considers that publication of the research would harm its interests, the student must write the report such that it is suitable for publication. In general this will imply masking of data and possible an appendix that is kept confidential. In this case the report must be readable without the appendix.
- A self-contained summary (of approximately three pages) must be included.
- Also a 'press release' must be included (according to the guidelines in the 'Press release manual' that can be downloaded from <http://education.ieis.tue.nl>, see the topic 'Thesis Manual and Forms').
- The report is self-contained (i.e. includes essentials of preliminary work such as the research proposal and the literature study), and must include at least: the problem statement/question; description and analysis of the researched phenomena; the accounting for the followed methodology; the conclusions and their funding data.
- The title page must include the title of the report, the authors name and student identity number, names of the supervisors and their respective Faculties, the title of the MSc program, the name of the student's Faculty, the name of the University and the publishing date. On the backside the subject codes and keywords must be placed. The standard layout of the title page is included in the zipped file that also included this document.
- Adequate subject codes and keywords must be included for characterising the master thesis. Subject codes must be chosen from the list of systematic codes from the TU/e Library. English keywords can be taken from the main thesaurus/keyword list. Also Dutch keywords might be included; these can be taken from the keyword register of the catalogue of the TU/e Library. The librarian can help you by choosing appropriate subject codes and keywords.
- Figures, tables and other exhibits must be numbered. Numbering can be consecutive throughout the report or per chapter. In the latter case, the number must be preceded by the chapter number (e.g. Figure 2.1 is the first figure in chapter 2).
- Figures, tables and other exhibits must have a caption that is descriptive.
- Headings must be numbered.
- Citations and references follow the APA 6th formatting guidelines, unless otherwise agreed with the first supervisor. The APA 6th guidelines are available at the library.



## II. Appendix 2: Principles Internship Agreements

	Student	Mentor	Department
<b>Compensation internship</b>	The student will personally come to an agreement with the company about compensation	-	-
<b>Confidentiality</b>	If requested, the student can personally sign for confidentiality for the duration of the internship (with a possible prolongation of max. 5 years after the internship)	If requested, the mentor and the second assessor can sign for confidentiality for the duration of the internship (with a possible prolongation of max. 5 years after the internship)	-
	The student will personally assure that he/she can meet <u>all</u> requirements for graduation, including mandatory publication of the thesis in the university library (masking of data is not desirable)	-	-
<b>IP</b>	The student will personally prevent that he/she signs away his/her IP-rights <u>after</u> the internship; this can severely impede his/her career for the future	-	IP that is developed during the internship, according to the Dutch law, already completely belongs to the company in case of an <u>educational</u> internship; this does not require any additional agreements between the company and the educational institution

*In case a company does not agree with the principles mentioned above, then please refer the negotiations to Eric van der Geer Rutten Rijswijk (e.v.d.geer@tue.nl)*

IP that is developed during the internship, according to the Dutch law, already completely belongs to the company in case of an educational internship. This does not require any additional agreements between the company and the educational institution.

For the students, it is important to come to an agreement with the company about possible compensation and confidentiality, whereas for the latter holds that publication in the university library is mandatory for graduation; exceptions are not possible; masking of data is not desirable either. Furthermore, it is important for students' career paths that the company does not demand prolongation of the IP-rights long after the internship.

For all aforementioned issues, the department can't and won't take responsibility. Possibly, in case the company insists, the mentor can sign a confidentiality agreement, but then solely regarding confidentiality.