



Middle European
interdisciplinary
master's programme in
Cognitive Science

MEi:CogSci Learning Contract for the Mobility Semester



Erasmus+

1 Student Information

Student name	Tiziana Srdoc
Home University	University of Vienna, Austria
Student ID Number (Home University)	12219149
Degree Programme Code (Home University)	UA 066 013
Host University	Comenius University in Bratislava, Slovakia

This learning contract ensures that the ECTS credits the MEi:CogSci-student acquires at the host university will be recognised at the home university. In order to make this contract valid, please follow the procedure below:

A) Preparation phase

1. **Planning of studies and courses at the host university:** Student fills out the semester contract in negotiation with local coordinator.
2. **Negotiation of Special Topic of Interest Module(s)/Mobility Project:** The student negotiates the *special topic of interest* (i.e., a cognitive phenomenon) they want to study and how (i.e., a combination of courses, lab work, self-study, literature used) with the supervisor.
3. **Concrete plan of the project:** The student specifies the work-plan for the module (elements of module, milestones, deliverables, dates,...).
4. **Acknowledgement:** The supervisor checks the contract and gives their OK;
 - a. The **student sends the LC to the local coordinators at the home and host university** (+ cc to the supervisor)
 - i. with the agreement sentence: "I agree to this learning contract"
 - ii. as a **.pdf only**
 - iii. adding their name to the title of the document, e.g. **SurnameName_LC_Mobility**
 - iv. with an email head of this format only: LC_ < student surname, first name> _<supervisor surname>
 - b. **Supervisor acknowledges that they accept the proposal by replying to the email (reply to all).**
5. **Approval by the home university:** The local coordinator at the home university approves it or requests changes (go back to step 2)

B) Mobility phase

6. **In case of changes in project/planned courses:** the student has to inform the coordinators at the host and home universities immediately.
7. After finishing the project, the supervisor grades, signs and stamps the document.
8. Graded, signed and stamped Learning Contract is sent to the coordinator of the host university **within the specified deadline**.

C) Grading & recognition phase

8. **Final grading & recognition:** Original signed contract & certificates/transcripts are returned to coordinator at home university for grade recognition after the project has been finished.

2 Semester Contract

S-I-CS New Trends in Cognitive Science Module: 10 ECTS				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Cognitive Semantics and Cognitive Theory of Representation	2L + 2S	5		
Deep Learning and Cognition	2L + 2S	5		
Module Grade				

S-I-PJ Special Topic of Interest (Project) Module: 15 ECTS				
Project Title	Supervisor	ECTS	Grade (host)	Grade (home)
Enhancing Metacognition through AI-Powered Self-Regulated Learning	Mgr. Kamila Urban, PhD.	15		
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Module Grade				

S-I Special Topic of Interest Module: __ ECTS				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Module Grade				

W-D-C Elective Module: 5 ECTS				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Mathematics for Cognitive Science	2L + 2S	5		
Module Grade				

Date, Stamp & Signature of Local Coordinator
at **Host** University

Date, Stamp & Signature of Local Coordinator
at **Home** University

2.1 Additional ECTS

In case a student wants to acquire more than 30 ECTS during the mobility semester, the modules and courses need to be indicated on this page.

Module: _____ ECTS: ____				
Course Title	Course Type	ECTS	Grade (host)	Grade (home)
Module Grade				

Date, Stamp & Signature of Local Coordinator
at **Host** University

Date, Stamp & Signature of Local Coordinator
at **Home** University

3 S-I-PJ Special Topic of Interest (Project) Module

Learning Outcomes*

Subject specific

- Advanced knowledge and understanding of a phenomenon from the perspective of at least two disciplines

Methodological

- Ability to approach a phenomenon in an interdisciplinary manner

Generic/Instrumental

- Ability to write and follow a project plan

Systemic

- Interdisciplinary work/thinking
- Project-oriented work and organisational skill
- Critical evaluation of approaches & methods
- Quick orientation & navigation in mother and/or novel complex field
- Change of viewpoint/perspectives (intellectual mobility)
- Phenomenon-oriented thinking
- Problem-solving abilities

*as defined in the MEi:CogSci curriculum

3.1 S-I-PJ Special Topic of Interest (Project) Module – Project Specifications

3.1.1 General Project Information

Title of Specialisation Project	Supervisor	ECTS
Enhancing Metacognition through AI-Powered Self-Regulated Learning	Mgr. Kamila Urban, PhD.	15
Course Title (if applicable)	Course Type	ECTS
Teamwork/Co-Student (if applicable)		
Tim Knapp		

3.1.2 Summary of Topic/Phenomenon (3000-4000 characters)

Mgr. Kamila Urban, PhD is a senior researcher at the Institute for Research in Social Communication, Slovak Academy of Sciences. Her research interests encompass developmental psychology, metacognition, creativity, and self-regulated learning. As part of the Special Topic of Interest (Project) Module, my colleague Tim Knapp and I are participating in her project which aims at development and evaluation of an AI-powered system that enhances metacognition and supports self-regulated learning (SRL).

Metacognition and SRL are closely related concepts, involving monitoring one's cognitive activities and using resources effectively for successful task completion (Dinsmore et al., 2008). Metacognition consists of two components: metacognitive knowledge (knowledge about self, task, and strategies) and metacognitive regulation (knowledge about planning, monitoring, and evaluating one's cognitive activities) (Flavell, 1985). Similarly, SRL includes three cyclic phases: forethought (task analysis, goal setting), performance or volitional control (self-control, self-observation) and self-reflection (self-judgment, self-reaction) (Zimmerman, 2000). Research consistently shows that metacognitive awareness, i.e., the ability to understand and regulate one's cognitive processes (Schraw, 2001), is crucial for learning success and motivation (Urban et al, 2021). However, many learners struggle to adequately self-regulate their learning (Zimmerman, 2000), especially in demanding tasks or with limited prior knowledge. At these times, external support, like prompting, can help learners engage in successful regulation (Guo, 2022). Metacognitive prompts guide students towards higher-level strategies (e.g., goal setting, planning, monitoring, regulation, and evaluation), enhancing metacognition and enabling strategic learning in new contexts (de Boer et al., 2018; Schraw, 2001).

Recent advances in generative artificial intelligence (AI) and its use in educational settings, highlight the increasing importance of metacognition (Joksimovic et al., 2023). AI, such as chatbots, has shown positive effects on students' learning, enhancing creativity, self-efficacy, and participation (Guo et al., 2023; Liu et al., 2022; Urban et al., 2023). However, AI technologies often fail to support SRL, as they tend to take over, i.e., *offload*, regulation from learners (Molenaar, 2022). This is counterproductive, as learners benefit from regulating their own learning. Thus, AI-powered systems should not replace learners but rather empower them to develop metacognition and SRL skills.

In our project, we aim to utilize ChatGPT to support students' metacognitive processes during a certain problem-solving task, and examine its effect on performance, engagement, and experience. The project's first phase, led by Tim Knapp, will involve creating a website and chatbot powered by ChatGPT. Using prompt engineering, we aim to develop a way to effectively use ChatGPT as a tool that enhances metacognitive processes during the task. Thus, instead of providing solutions, ChatGPT will prompt students to plan, monitor, and evaluate their problem-solving process. This approach aligns with the concept of hybrid human-AI regulation which focuses on training human SRL skills with AI (Molenaar, 2022).

The second phase of the project, led by Tiziana Srdoc, will compare university students using ChatGPT metacognitive prompting during the task with those who do not. The experimental group will interact with the chatbot, the second group will interact with ChatGPT that was not prompted to enhance metacognition, and the third group will perform the task independently. Data on students' performance, engagement, and experience will be collected. We anticipate that prompting students to plan, monitor, and evaluate their learning process will stimulate strategy use and improve their conceptual understanding and learning outcomes. Hence, this project represents a valuable effort to engage learners in critical interactions and make them active contributors to their knowledge construction using chatbots.

REFERENCES

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3.2 Project Plan

The parties are aware that the project has to be finished by February 16th 2024.

Information on deadlines at host and home universities is available on the MEi:CogSci websites.

3.2.1 Project Steps

Literature Research				Total Working Hours (WH)/ECTS: 50 / 2	
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Literature 1	10/2023 – 01/2024	50/2	Reviewing the literature on metacognition, self-regulated learning, and AI in education	Access to literature	M1 Lit

Formulating Hypotheses/Theses				Total WH/ECTS: 15 / 0.6	
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Hypotheses 1	11/2023	15/0.6	Formulating the aim of the study, research questions, and hypotheses	Access to literature, consultations with the supervisors and co-student	M2 Theses

Planning Means of Data Acquisition				Total WH/ECTS: 60 / 2.4	
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Design 1	11/2023 – 12/2023	35/1.4	Developing and optimizing prompts to effectively use ChatGPT to induce metacognitive process in students; designing the experiment task	Access to literature, access to ChatGPT API, consultations with the supervisors and co-student	M3 Plan
WP Design 2	11/2023 – 12/2023	20/0.8	Selecting and adjusting measurement tools or questionnaires to assess students' performance, engagement, and experience	Access to literature, consultations with the supervisors	M4 Plan
WP Design 3	12/2023	5/0.2	Protocol definition	Consultations with the supervisors	M5 Plan

Data Acquisition/Collection					Total WH/ECTS: 50 / 2
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Data 1	01/2024	50/2	Organizing testing sessions; implementing the experiment in a classroom; filling out the questionnaires with the students	Classroom, participants, laptops for running the experiment, online questionnaires, and assessment sheets	M6 Data Coll

Data Analysis/Interpretation					Total WH/ECTS: 125 / 5
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Analysis 1	11/2023 – 01/2024	50/2	Learning how to perform statistical analysis in R/R Studio	Access to literature, access to online tutorials, R/R Studio	M7 Analysis
WP Analysis 2	01/2024	50/2	Organizing, analysing, and visualising collected data using R/R Studio	MS Excel, R/R Studio	M8 Analysis
WP Analysis 3	01/2024	25/1	Writing down and interpreting the obtained results	Access to literature, consultations with the supervisors	M9 Analysis

Project Documentation					Total WH/ECTS: 75 / 3
Working-package (WP)	Start – End	WH / ECTS	Activities	Resources required	Milestones (M)
WP Doku 1	10/2023 – 02/2024	25/1	Setting up the learning contract; writing the summary of the topic and personal goals; writing a short project report at the end	Access to literature, consultations with the supervisors and co-student	M10 Docu
WP Doku 2	02/2024	50/2	Writing a longer project report (10-12 pages) together with the co-student where we will present the literature review, method, results, and develop discussion	Access to literature, consultations with the supervisors and co-student	M11 Docu

3.2.2 Project Milestones

Mile-stone	Result/"Product" and/or Deliverables
M1 Lit	Literature review; understanding of the research topic and methods; ability to critically evaluate and draw upon previous research
M2 Theses	Defined objectives and hypotheses; ability to communicate the aim and significance of the study
M3 Plan	Study design; ability to utilize generative AI in research design; ability to design an empirical study on the topic of metacognition and SRL
M4 Plan	Study design; ability to employ questionnaires to evaluate the outcomes of an intervention
M5 Plan	Defined protocol; ability to communicate the crucial steps of the experiment and design the instructions for student participants
M6 Data Coll	Study implementation; ability to recruit participants; ability to organize and conduct an experiment in a classroom setting
M7 Analysis	General understanding of R language; ability to perform statistical analysis using a new programming language R/R Studio
M8 Analysis	Statistical analysis; ability to organize, analyse and visualise collected data
M9 Analysis	Result interpretation; ability to interpret and discuss the findings of the study
M10 Docu	Learning contract; ability to identify and report on crucial milestones, content, and methods of a research project
M11 Docu	Project report; ability to communicate study's aim, method, design, and findings; ability to defend one's work and identify its limitations

3.3 Short Project Report (~1 page, 3000-5000 characters)

Final grade for the project

____ / ____
Host Grade / **Home** Grade
(see grade conversion matrix on last page)

Date, Stamp & Signature of Supervisor (Host University)

Grade Conversion Matrix

BRAT		BUD		LJUB		VIE		ZAG	
A	výborne (excellent)	5	jeles (excellent)	10	odlično (excellent)	1	sehr gut (excellent)	5	odličan (excellent)
B	vel'mi dobre (very good)	4	jó (good)	9	prav dobro (very good)	2	gut (good)	4	vrlo dobar (very good)
C	dobre (good)	4	jó (good)	8	prav dobro (very good)	2	gut (good)	4	vrlo dobar (very good)
D	uspokojivo (satisfactory)	3	Közepes (fair)	7	dobro (good)	3	befriedigend (satisfactory)	3	dobar (good)
E	dostatočne (sufficient)	2	Elégséges (satisfactory)	6	Zadostno (sufficient)	4	genügend (sufficient)	2	dovoljan (satisfactory)
F	nedostatočne (insufficient)	1	Elégtelen (fail)	5	nezadostno (insufficient)	5	nicht genügend (insufficient)	1	nedovoljan (insatisfactory)