

Note

The Norwegian Center for Interdisciplinary Education (INTED)

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Received: April 28th 2023; Accepted: December 8th 2023; Published: December 13th 2023

Keywords: Honor Education; Interdisciplinarity; Facilitator Program

1. Introduction

Interdisciplinarity in higher education is crucial for addressing complex issues such as sustainable development (Mokski, 2022). The development and implementation of interdisciplinary curricula require careful consideration of pedagogical and epistemological issues (Davies & Devlin, 2010). There is a need to involve students in all stages of interdisciplinary projects and explicitly train them in interdisciplinary integration (Horn et al., 2023). Despite its importance, interdisciplinarity faces multiple obstacles at pedagogical and administrative levels, and developing successful strategies for its promotion are needed (MacLeod, 2018).

The University of Oslo (UiO) is organized as a research and educational institution, with strong disciplinary traditions. In 2019 the first honors program was established as one of the first larger education programs with the collaboration of three departments and with the intent to give students interdisciplinary competence.

Even though in recent years interdisciplinarity has become central in the strategic plans of Oslo University, there is still a need to develop innovative learning approaches that provide students

with the depth needed to excel in one discipline but also with the skills and knowledge that prepare them for an interdisciplinary working place. There is a need for developing partnerships among different sectors and for a culture of interdisciplinarity among all employees in the higher education system both at educational and administrative levels.

2. The INTED Center

In order to address these challenges, the Center for Interdisciplinary Education (INTED) was established as a national and international hub for the research-based integration of interdisciplinary competence in higher education. INTED is located at Oslo University, and it is a 10-year project (2023-2033), financed by The Directorate for Higher Education and Skills, under the Norwegian Ministry of Education and Research to establish a center for excellence to enhance the quality of Norwegian higher education. The center is a collaboration between the faculties of humanities, social sciences, and mathematics and natural sciences, with the support of the faculty of educational sciences at UiO. We already have experience with complex institutional transformation processes from creating new interdisciplinary study programs with associated courses across departments and faculties and new courses and sessions with external stakeholders and students from the three faculties mentioned above.

In an effort to achieve an institutional change and impact at national and international levels, the center will use honors programs, courses, and sessions as laboratories to develop, pilot, evaluate, and scale new learning approaches and pathways to bring teachers and students into a culture of interdisciplinary teaching and learning. Students will be at the heart of the center and involved in center leadership, program and course designs, as well as teaching and evaluation. Honors students will co-create in tandem with academic and program leaders, developing and testing learning activities and assessments, as well as providing assistance to improve the learning of other students. In order to become engaged in their own transformation and support the transformation of others, students receive integrated pedagogical training based on the Learning Assistant model.

INTED's vision is to establish a national and international hub for the research-based integration of interdisciplinary competence in higher education. Our objectives are to

- (1) develop programs, methods, pedagogies and approaches for interdisciplinary education;
- (2) establish a community and culture of interdisciplinary teaching and learning;
- (3) disseminate methods and approaches to interdisciplinary education locally, nationally, and internationally; and
- (4) build a research basis for interdisciplinary teaching and learning and measure the impact of our activities.

The first objective mentioned above aims at developing interdisciplinary education. Figure 1 illustrates in more detail the development of three scales – programs, courses and sessions – where teachers and students from different disciplines come together.

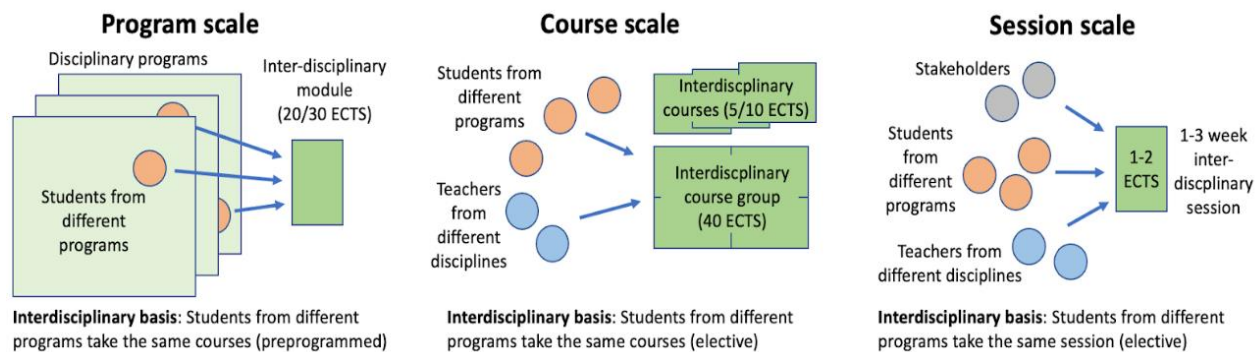


Figure 1. INTED uses the following Innovation Principles:

Evidence-based approaches: INTED’s development activities will include both general principles of teaching, learning, and program design as well as principles for interdisciplinary learning. All development and teaching supported by the center will be based on general evidence-based approaches that focus on student learning and incorporate active learning principles.

Principles for interdisciplinary integration: Our activities will be designed to support interdisciplinary competence through the integration of disciplinary knowledge. We will therefore develop approaches and evaluate them through educational research projects. We will start from established principles from research on interdisciplinary education. These principles will be integrated in educational designs, courses, and facilitator training programs.

Supporting interdisciplinary integration: We will develop, pilot, and evaluate several approaches to help students learn to integrate insights across disciplines through problem-based and project-based learning in interdisciplinary groups and by writing for interdisciplinary understanding. This will, for example, be done by having regular sessions where teams of teachers discuss integration with students or by having students write reflection notes on how the disciplines are affected by the integration.

Our long-term aim is to support and inspire students, teachers, administration, leadership, and stakeholders to develop interdisciplinary competence and to participate in, facilitate, and lead interdisciplinary processes. This hopefully will push higher education institutions, researchers, and innovators toward interdisciplinary approaches, which in turn will improve our ability to make breakthroughs, to innovate, and to address grand challenges.

3. INTED Activities (2003-2024)

As previously mentioned, the center focuses on several activities involving students from different disciplines and is using the honors program and its students as it is one of the larger interdisciplinary initiatives at UiO. The activities span from workshops to teaching programs for teaching assistants involved in programs, courses, and workshops as well as small research projects for students.

Interdisciplinary Workshops

One of the activities that INTED develops is an Interdisciplinary Workshop. The workshop is interdisciplinary and student driven at all levels. The vision behind the workshop is to provide students with an interdisciplinary learning experience in an academic setting that is directed at real world cases.

The workshop is put together by an interdisciplinary team with a stakeholder and presented to an interdisciplinary student group. In our most recent workshop, the case was presented by Nina Simon, from NF&TA, which is the organization for the textile industry in Norway. The case was to apply system thinking for evaluating the impact of various efforts in the textile industry.

To facilitate the integration needed for true interdisciplinarity, the facilitators go through an interdisciplinary facilitator program, as further discussed below. This gives them both tools needed to facilitate the workshop but also a framework to evaluate the processes. The core ideas of interdisciplinary cooperation are also presented to the student groups and applied in solving the case.

Further, we emphasize student involvement. Instead of only incentivizing students to take multiple courses from their own subjects, we provide an alternative route to academic and work-life competence. After undergoing the workshop, students are invited to partake in our interdisciplinary facilitator program and INTEDS project. This provides a ladder-based approach, where students first go through the workshop, then help facilitate the workshop while undergoing training, and in the end become project leaders for the workshop. The experience gives students valuable competence, while strengthening their own use of interdisciplinary tools and helping them develop leadership of interdisciplinary teams. The whole process is scalable, and it allows us to tap into students' own resources and gives them a platform to apply their own interests and lived experience.

One valuable takeaway from our interdisciplinary workshops is the implementation of design thinking tools in an academic setting. This included an emphasis on investigation before implementing solutions, close contact with stakeholders, and an iterated process of testing and redefining the problem description. While design thinking mainly is directed at innovation (Rösch et al., 2023), it also served as a tool to provide students with the framework needed to work with the case.

The Interdisciplinary Facilitator Program

The Interdisciplinary Facilitator Program's main objectives is to support interdisciplinary initiatives by training teaching assistants (TA) in how to facilitate student groups in the development of interdisciplinary competence (Shannon et al., 1998).

As this is INTEDs first year, the Interdisciplinary Facilitator Program was piloted with one initiative. The program has a three-folded mission: giving the TAs knowledge about interdisciplinarity and integrative learning (Klein, 2005), providing facilitation skills (Nelson & McFadzean, 1998), and creating a community of practice to discuss and share their experiences. The program follows the semester, giving the TAs the opportunity to get pedagogical training and facilitating experience altering while they are teaching (Shannon et al., 1998).

The TAs express that the facilitating program was important to understand the difference between group work and interdisciplinary groups, with the emphasis on how the groups integrate their perspectives, instead of dividing the group work among participants or allocating roles. They also expressed appreciation for a community with the other TAs and being able to discuss challenges as TAs for an interdisciplinary course. Going forward, the Interdisciplinary Facilitator Program will be offered on a larger scale at UiO to support several interdisciplinary initiatives and to continue to improve.

Research at INTED

As part of INTED's activities we will also conduct research to investigate today's practice at UiO and evaluate different interdisciplinary initiatives, either organized by INTED or others at UiO. The research will be divided into projects using different methods to capture the complexity of interdisciplinary competence and teaching methods that mobilize interdisciplinary competence.

Student report projects

In the summer of 2023, three interdisciplinary honors student teams made preliminary investigations by mapping interdisciplinary initiatives at UiO, making a literature review on research done on interdisciplinary competence in education and making an overview of teaching methods used in connection with interdisciplinary teamwork.

The results gathered in these reports are useful starting points that will guide INTEDs activities further on. The reports also gave us an understanding about existing interdisciplinary initiatives at UiO and their degree of collaboration or lack of collaboration with environments that would improve and support their development. The reports are open access and available on INTEDs website: <https://www.uio.no/inted/>

Practice and understanding of interdisciplinarity

As a method to investigate educational practice, the initiatives are understood as pods where we interview subjects with different roles within a pod. By talking to students, teachers, administrative staff, and leaders in one pod, we want to establish an understanding of how they have organized the initiative. The practice describes everything from curriculum development,

teaching methods, and how they have established interdisciplinary student groups to how they experienced the initiative and what has been the learning outcome.

Within the honors program, INTED has developed the research questions further to investigate teaching methods, student collaboration, and interdisciplinary competence.

Educational methods for interdisciplinarity and using the Honors program as a test base

HON3000 – Interdisciplinary Project is a course within the honors program that seeks to give students the knowledge and experience in interdisciplinary approaches to analyze large societal challenges. As of fall 2023, we have experimented with using the debate form as a teaching method to develop interdisciplinary competence. Students will use *debate* as a strategy and are divided into groups that counter play different perspectives in connection to a societal challenge. By using the debate form, we want to investigate how students learn in deeper ways and develop stronger critical thinking skills (Yang & Rusli, 2012). By the end of the semester, the course will be evaluated, and the students will participate in focus groups to elaborate on the experience and how they have developed interdisciplinary competence.

Interdisciplinary Workshops - The interdisciplinary workshops arranged by INTED also were a test base in which honors students participated. After each day students wrote reflection notes based on specific questions about their experiences. In the future, the reflection notes will be used to compare and understand how students develop interdisciplinary competence.

4. Closing Thoughts

The funding and collaboration behind INTED highlights the need to establish a research-based community for interdisciplinary in higher education at UiO and in Norway. Many more INTED activities will be developed and piloted in the coming years. Our highly competent interdisciplinary team of teachers and our motivated interdisciplinary honors students together with our partners and network have the potential to make INTED a national and international hub for good interdisciplinary practice and research. And last but not least, our work gives high quality, interdisciplinary, transforming experiences and skills to the change makers: our students

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