

Its21 4th conference on
interdisciplinary teamwork skills
for the 21st century



Program, workshops and abstracts

Its21 4th conference in interdisciplinary teamwork skills for the 21st century

20-21st June 2018
NTNU Trondheim



Program

Wednesday June 20th

08:30 - 09:00 Registration

09:00 - 10:00 Plenary session Welcome to Its21 2018
Anne Borg, pro-rector for education at NTNU

The role of interdisciplinary collaboration in a world of enabling technologies and big societal challenges

Ottar Henriksen

SINTEF Raufoss Manufacturing AS

10:00 - 10:15 Break

10:15 - 13:15 Parallel workshops

Workshop 1A Applications for self-organizing teams and organizations

Workshop 1B Design thinking

Workshop 1C Skills you need to succeed with interdisciplinary work

13:15 - 14:30 Lunch

14:30 - 16:00 Parallel sessions

Session 1A Educating for interdisciplinary teamwork skills

Session 1B Collaboration between higher education and work life

Session 1C Symposium - Interprofessional education: INTERACT

Session 1D Teamwork competences that support innovation

16:00 - 16:15 Break

16:15 - 17:00 Interdisciplinary teamwork: why (not)?!

Panel discussion led by Monica Rolfsen

Lise Lyngsnes Randeberg, Tekna and NTNU

Marie Löwegren, Lunds Universitet

Roger Sørheim, NTNU

Ottar Henriksen, SINTEF Raufoss AS

Are Holen, NTNU

19:00 Conference dinner at Lian restaurant

Thursday June 21st

- 08:30 - 09:15 Plenary session
Active approaches to learning and interdisciplinary challenges in higher education
Are Holen
NTNU
- 09:15 - 09:30 Break
- 09:30 - 12:30 **Parallel workshops**
Workshop 2a Experts in Teamwork - Facilitation for enhanced collaboration
Workshop 2b Can entrepreneurship be taught?
Workshop 2c Communication challenges across scientific boundaries
Interdisciplinary work in ocean sciences
- 12:30 - 13:45 Lunch
- 13:45 - 15:15 **Parallel sessions**
Session 2A Educating for interdisciplinary teamwork skills
Session 2B Collaboration between higher education and work life
Session 2C Interprofessional education (healthcare)
Session 2D Challenges in interdisciplinary teamwork
- 15:15 - 15:30 Break
- 15:30 - 16:00 Summary and closing of the conference

Workshops

Wednesday June 20th 10:15 - 13:15

Applications for self-organizing teams and organizations

Workshop 1A

In this explorative workshop we will present core principles for self-organization and test out how these principles can be transformed to practical applications in a workplace. We will use the framework “Open Participatory Organizations (OPO)” and recent research on autonomous teams as a starting ground. The OPO framework represent an innovative way of how to organize work without fixed roles and hierarchical structures - allowing autonomous teams to blossom.

The workshop is facilitated by Nils Brede Moe (SINTEF) and John Richard Hansen (Abilator AS / Center for Transformative Leadership AS).

Design thinking

Workshop 1B

In this rapidly changing world, organizations more than ever must focus on their customers and main stakeholders and learn to empathise with their needs. Design thinking (DT), a methodology developed at Stanford University, enables firms to do just that. DT is practical, human-centered, and prototype-driven. It helps teams of diverse people tackle fuzzy, ill-defined challenges in creative ways. These challenges can come in many shapes and sizes, for example, the development of new products, services, and experiences; the design of business models; or the structuring of organizational systems.

As design thinkers, we begin by focusing on the human experience. We understand that the most impactful innovations are those that address important human needs in meaningful ways. To understand these needs, we adopt a deeply empathic perspective by standing in the shoes of others, and experiencing life from their perspective. This is not new, however. Anthropologists have been doing this for generations. Design thinking simply relays this powerful approach to address the challenges of modern-day organizations.

In this workshop, we will explore the power of DT and empathy through multiple hands-on, experiential, fast-paced, and fun exercises. In this workshop you will learn to:

Communicate lessons through a powerful teaching style, which taps into students' intellect and emotions

Guide students in deep learning, introspection, and reflection through the use of metacognitive skills

Balance between being a strong facilitator and permitting your students to fail safely and deal with ambiguity

The workshop is facilitated by Federico Lozano (NTNU, NHH, DT Bergen, Pracademy)

Skills you need to succeed with interdisciplinary work

Workshop 1C

Addressing Grand Societal Challenges such as climate change or food security implies interdisciplinary work, e.g. as stated in Horizon 2020 calls. Interdisciplinarity involves the combining of two or more academic disciplines into one activity: crossing the doctrine, practice and ethos of disciplinary boundaries. This might sound straightforward on paper, but time and again interdisciplinary research projects fail to achieve learning and outcomes across disciplines

This workshop offers training and tools to ensure that interdisciplinary work can become successful. We approach research communication as an embodied, performed and performative aspect of research practice – where body postures, voices, eye contact and feelings matter. The workshop is interactive and includes exercises that aim to explore the following skills related to effective collaboration and communication: trust, acceptance, attentive listening and embracing failure. At the end of the workshop participants will have some idea of how to pick up on and train some of the aptitudes crucial for interdisciplinary work

Workshop leaders are Bogdan Glogovac (Ducky and Gibberish improv theatre) and Kristoffer Nergård (Gibberish improv theatre)

Thursday June 21th 09:30 - 12:30

Experts in Teamwork - Facilitation for enhanced collaboration

Workshop 2a

The use of groups is common in both education and work life. The intent is usually to achieve greater results in productivity, learning and more, although these results and the process towards them may be lacking. This may be due to uneven group involvement, someone sneaking away, limited critical group thinking or conflicts, etc. How can we facilitate groups so the participants themselves can become able to address such challenges?

In Experts in Teamwork at NTNU (EiT) we use facilitation to activate potentials for better interaction in student groups. In this workshop, the participants will learn some techniques of basic facilitation as practiced in EiT. Particular emphasis is placed on observation, the use of sociograms and training in asking open-ended questions at the group level.

Workshop leaders are Sven Veine, and Lars Skancke from Experts in teamwork, NTNU

Can entrepreneurship be taught?

Workshop 2b

NTNU's school of entrepreneurship is a master program at NTNU where students become change agents and learn entrepreneurship through starting their own company. The school's unique teaching methodology focuses on a combination of theory and practical problem solving, with the goal of educating the best business developers in the world. In this workshop, faculty from NTNU's school of entrepreneurship will share their teaching methodology and explain how they work with entrepreneurship and innovation. Their way of thinking can be implemented into all research areas and privat/public industries, and all participants will receive a framework on how they can work with innovation and entrepreneurship in their organization or in teaching contexts. The workshop will be interactive and include group work.

Workshop leader is Even Haug Larsen, NTNU

Communication challenges across scientific boundaries - Interdisciplinary work in ocean sciences

Workshop 2c

Interdisciplinary collaboration is essential for solving complex problems. NTNU Oceans is determined to increase collaboration across scientific borders regardless of its complexity. However, there is one issue to consider as research shows that multidisciplinary teams more often fail than succeed in achieving excellence.

In this workshop we will discuss questions such as:

What kind of expertise do researchers need to be able to contribute in interdisciplinary teams?

What skills are needed to join and create interdisciplinary teams

What are the bases for successful interdisciplinary workgroups

We will also work on practical cases related to NTNU Oceans Deep Sea Mining project to find work routines that will make interdisciplinary work more successful.

Workshop leader is

Parallel sessions

Wednesday June 20th 14:30 - 16:00

Session 1A Educating for interdisciplinary teamwork skills

Chair: Anita Iversen, UiT

1A-1: Developing Students' Teamwork Skills and Challenges of Faculty Members

Bjørn Sortland, Are Holen, *NTNU*

1A-2: Teamwork and the transition to employment

Gunhild Lundberg, *NTNU*

1A-3: Is it all about giving the control to the students? A toolbox for developing group work in shorter courses.

Svante Axelsson, *Uppsala universitet*

1A-4: Running a company with a totally flat structure. What processes and collaborative competences are required?

Mads Simonsen, *Ducky*

Session 1B Collaboration between higher education and work life

Chair: Inger Beate Pettersen, HVL

1B-1: Bane NOR and Jernbanedirektoratets (JD) thoughts on collaborating with NTNU. What's in it for us?

Håkon Andreassen, *BaneNOR*

1B-2: Humanities in practice – answering to as well as challenging work life demands

Helen J. Gansmo, *NTNU*

1B-3: Design Thinking, from theory to practice

Torhild Eide Torgersen, *NTNU*

1B-4: Collaborative placemaking - the city as an urban space innovation lab

Kristin S. Næss, *Trondheim kommune*

Session 1C Symposium - Interprofessional education: INTERACT

Chair: Inger Ulleberg, OsloMet

1C-1: Constructing Interprofessional Education: The case of INTERACT (Inter-professional Interaction with Children and Youth)

Camilla Foss, Liv M. Guldbrandsen, Knut Løndal, Inger Ulleberg, Nina B. Ødegaard, Ingvil Øien, *OsloMet*

Session 1D Teamwork competences that support innovation

Chair: Gry Alsos, Nord universitet

1D-1: Integrating entrepreneurial skills in the course Experts in Teamwork

Elli Verhulst, Nina H. Andersen, Thomas C. Espenes, Sigrid W. Brandshaug, Marte Konstad, *NTNU*

1D-2: How to improve interdisciplinary and innovation competences among bachelor of engineering students

Hanne Løje, *DTU*

1D-3: Jumpstarting interdisciplinary collaboration with Design sprints

Vidar Tilrem, *Kantega*

1D-4: How to fail with design driven innovation?

Bjørnar K. Reinertsen, *FARA*

Thursday 21 June, 13:45 - 15:15

Session 2A Educating for interdisciplinary teamwork skills

Chair: Steffen K. Johansen, SDU

2A-1: Rethink EiT 2017 at business academy Aarhus - Co-creation of common practice for master facilitators and tools for facilitation

Lea Sørensen, Susanne Ø. Olsen, Mette R. Olsen, *Business Academy Aarhus*

2A-2: Supplementary Instruction - a student-active learning form

Roger Helde, Elisabeth Suzen, *Nord universitet*

2A-3: 'Teachers in Team' – facilitating student teachers' reflection on teamwork skills

Ela Sjølie, Alex Strømme, Juliette Boks-Vlemmix, *NTNU*

2A-4: Giving and receiving feedback: how hard can it be?

Gunhild Roald, Ida M. Gabrielsen, *NTNU*

Session 2B Collaboration between higher education and work life

Chair: Svante Axelsson, Uppsala universitet

2B-1: A student perspective on collaboration between higher education and work life

Marte Bonnegolt, *NTNU*

2B-2: Challenging the curricular framework through guerrilla pedagogy and pedagogic intrapreneurship

Knut Boge, Petter Øyan, *OsloMet*

2B-3: Corporate and students - When TrønderEnergi met Entrepreneur students from NTNU

Aleksander Nybøle, *TrønderEnergi*

2B-4: Student contributions to accelerate regional business transformation – the green transition

Per-Erik Sørås, *Trøndelag fylkeskommune*

Session 2C Interprofessional education (healthcare)

Chair: Sissel Brenna, HVL

2C-1: Interprofessional learning in practice; alignment with the workplace
Anders Bærheim, Reidun L.S. Kjome, Tiril Grimeland, Ane Johannessen, *UiB*
Sissel J. Brenna, *HVL*

2C-2: Does the nature of interprofessional education in health and social sciences foster a need for special tutor competencies?

Nanna Hauksdottir, Anita Iversen, *UiT*

2C-3: Interprofessional psychogeriatric educational practice - the importance of professional boundary crossing to improve collaboration

Anita Iversen, Rita Jentoft, *UiT*

Session 2D Challenges in interdisciplinary teamwork

Chair: Ulla Haahr, BA Aarhus

2D-1: Interdisciplinary teamwork in the DigiFab project – the journey from start until now

Ingvild Jensen, *Q3 Partners AS*; Elli Verhulst, *NTNU*

2D-2: Creativity and structure in teamwork - a new course design for deeper learning outcomes

Anette Oxenswärdh, Per-Arne Forsberg, *Uppsala universitet*

2D-3: SULITEST – Sustainable Literacy Test. A measure for teaching sustainable development and interdisciplinary teamwork. Experience from NTNU

Charlotte S.E. Teigen, John E. Hermansen, *NTNU*

2D-4: Archives and libraries brought into the 21st century through interdisciplinary teamwork. Lessons learned and challenges to reflect upon.

Alexandra Angeletaki, *NTNU*

Abstracts

Wednesday June 20th 14:30 - 16:00

Session 1A Educating for interdisciplinary teamwork skills

Developing Students' Teamwork Skills and Challenges of Faculty Members

1A-1: Bjørn Sortland, Are Holen, *NTNU*

The aim of the educational program «Experts in Team» (EiT) at NTNU is to train master degree students in developing collaborative and interdisciplinary team work skills. The degree to which this goal has been attained in the students may be assessed in relations to these levels:

1. Knowledge (theory)
- 2 Goal-oriented interaction (hands on experience)
3. Reflections on the quality of the collaboration within the team (meta-cognitive perspectives, and concepts) and their personal contributions towards this end (self-reflection)
4. Training in giving adequate feedback related to how the team is collaborating (skills training)
5. Ability to use their accumulated insights, skills and feedback to enhance the quality of their team work (changing patterns of collaborating)
6. Development of generalizable awareness about central requirements that would make teams function well and that is likely to be transferred into future teams in jobs and private life.

In the spring term of 2018, 80 faculty members at NTNU are in charge of interdisciplinary EiT classes (villages or projects), each consisting of 25-30 master students from various fields. In accordance with the learning objectives laid down by the university, the faculty members are expected to contribute towards the development of collaborative team skills in the students.

One major component to achieve this aim is that the involved faculty members of diverse backgrounds participate in advance in a faculty development program under the aegis of the Experts in Team. The EiT program has also published a resource book in Norwegian and English containing educational social exercises that may be applied to aid the teams in their learning processes. Moreover, an inventory has been developed with a scoring algorithm in Excel. The students of each team complete this inventory two or three times during the team life. The responses indicate how the team is doing on several essential dimensions. Experience over some years shows that this inventory usually instigates constructive discussions among the students and often leads to improved collaboration and more efficiency in the team work.

Teamwork and the transition to employment

1A-2: Gunhild Lundberg, *NTNU*

The study program “Information Technology with specialization in Network Administration” (ITNA) at Kalvskinnet, NTNU has really put the need for teamwork on their agenda. Through tight collaboration with IT-companies, they listen to the changes in the market and their demands. Undergraduates from this study program is educated to fill a specific role in the IT-company – namely to administrate the networks. In the last decade this role has changed from being an individual job where you had the responsibility alone, to be a job that you do as part of a team. Due to the wishes from the market NTNU have decided to implement teamwork in almost every course they are offering. In fact, they demand some sort of teamwork in 160 of total 180 credits.

This might seem a lot, especially when I found through my previous research that teamwork was the sixth most discussed topic by recruitment managers during the interviews where the theme was “what do you seek after when hiring a graduate from ITNA”. The five more discussed topics was “Interest in the field”, “organizational understanding”, “oral communication skill”, “the diploma and CV”, “to be reliable and responsible” (soon to be published(Lundberg, Gaustad, & Krogstie, n.d.))

The focus on teamwork seems to be a bit high compared the other topics. And you can start wondering if the teamwork is primarily a pedagogical grip, and not an answer to the market demands. At the same time – since many of the courses is student-led learning activities with teamwork, they also foster oral communication skills, to be reliable and responsible, self-driven, sociable and so on. All of which the recruitment managers tend to seek for when hiring a graduate.

It also makes the transition to employment easier for the students as one of the undergraduates explains:

“It was very easy to start working since they work the same way we are used to from the study program, with new projects all the time. So very useful to have been working that way in three years already” (informant B3).

This is also supported by several of the recruitment managers. Should this increased focus on teamwork be implemented in every bachelor’s degree at NTNU? What about the other skills a graduate should have, how do we secure that they also be a part of the education? Is the focus on teamwork different between the old colleges and the old university?

Is it all about giving the control to the students? A toolbox for developing group work in shorter courses.

1A-3: Svante Axelsson, *Uppsala universitet*

When groups are working toward a common goal are working well it is because they and the group dynamics is working well. Maybe even some trust has become an important ingredient in the communication and between the group members. The start of group work is important and in the hands of the teachers.

The presentation is based on the case of a course including a two week long group work in a Swedish interdisciplinary summer on master's level. The tools and methodology used are based on research on group development (the temporal aspect of groups), different roles that a group needs to be able to work effectively, and how the group becomes aware of its own communication pattern. The course uses the description by Belbin on team roles for effective group work, and although there is critique in the literature to the effectiveness of using this method it makes the students think about their own strengths and weaknesses in group work. The students defines their own roles and search for complementary roles among the other course participants. They also make the group as interdisciplinary as possible. This part is not straight forward because interdisciplinary group, although gives better results in a longer perspective, have a longer takeoff (Hammar Chiriac & Hempel). The teachers have knowledge of different views on groups which is important to not to pitfall into a behavioristic view on any eventual conflicts. The fundamental method is that the students should solve any conflicts themselves, but with the help of the teacher.

The coaching method in this course uses the tools of role plays of different situations that typically uses situations of different personalities seen in the communication styles and how the time in oral communication is shared, leadership and softer conflicts described as the "pink elephant". The course uses the observation techniques, learnt from the Expert in Teams colleagues at NTNU. This has proven very useful and the students ask for more.

The goals of the course is about developing a serious game in health working on challenges from health care, companies and elder care. This is a vast assignment for the students since few of them have more than a common game experience. The presentations of the product is a short written report, a short oral presentation, a pitch, in front of an expert panel.

Hammar Chirac, Eva & Anders Hempel (reds.) (2013) *Handbok för grupparbete – att skapa fungerande grupparbeten i undervisning*, s. 193-219 Lund: Studentlitteratur

Running a company with a totally flat structure. What processes and collaborative competences are required?

1A-4: Mads Simonsen, *Ducky*

Session 1B Collaboration between higher education and work life

Bane NOR and Jernbanedirektoratets (JD) thoughts on collaborating with NTNU. What's in it for us?

1B-1: Håkon Andreassen, *BaneNOR*

Humanities in practice – answering to as well as challenging work life demands

1B-2: Helen J. Gansmo, *NTNU*

This presentation will elaborate on how we succeed with developing interdisciplinary teamwork skills and entrepreneurial mind sets through collaborative learning and group work in higher education and through internship placements in a broad variety of public organizations and private corporations.

Since 2005 Humanities in practice (HiP) has been offered master students at the Faculty of Humanities as an alternative to the compulsory subject Experts in team (EiT) at The Norwegian University of Science and Technology (NTNU). EiT was established in 2001 in response to work life demands arguing that students need to learn interdisciplinary teamwork skills. This demand was raised in a time characterized by increasing focus on interdisciplinary problem solving and merging of different knowledge cultures in research, teaching and industry, as well as a physical merger of two different knowledge cultures and campuses in Trondheim as the traditional university was merged with the technical civil engineering education in 1996. HiP was initially based on the same pedagogy and work life demand as EiT, but was designed in response to research on transition to work life and reports from EiT observing that humanities students were struggling with identifying their role and subject specific identity in EiT groups dominated by students from more profession like educations like civil engineering. In addition to representing two different knowledge cultures from two different campuses with quite different identities, these students also experienced quite different transitions to industry - as civil engineers often have been hired to well paid jobs prior to finishing their masters, while students from the humanities often have experienced slower transition to jobs (in the public sector) less in accordance with their expectations and subjects specific skills. Hence, HiP was initially established to teach students

from the humanities that there is a place for them as well in work life.

The internship placements of groups of 2-3 humanities students not only empower the students and train them in entrepreneurial skills and mind sets. Based on observations of recent and rapid changes in work life and continuous dialogue with industry HiP also challenges work life expectations of (future) education by demonstrating through practice in interdisciplinary workplace settings that students from the humanities are valuable in all kinds of organizations. HiP hence work both as an invitation to faculty to engage more in dialogue with industry as well as a warning against short term work life demands from industry.

Design Thinking, from theory to practice

1B-3: Torhild Eide Torgersen, *NTNU*

Design Thinking: Strategic design for innovation is a 7 month master-level executive education, delivered in collaboration between Norwegian School of Economics (NHH), University of Bergen, Institute of Design (UiB), Western Norway University of Applied Sciences (HVL) and Norwegian University of Science and Technology (NTNU), facilitated by Design Region Bergen. The program is the first of its kind in Norway.

The student cohorts are highly cross-disciplinary, consisting of people with backgrounds from engineering, business, design, psychology, photography, journalism, teaching, lawyers, health workers etc., and with a broad age range. (Last year's cohort included students as young as born in 1989 and as old as born in 1959). Click on the links to get an overview of the actual students from team 2 and team 3.

The program is initiated and managed by Design Region Bergen, a non-profit organization working for more design driven innovation within public sector and industry. It has been developed in close collaboration with both the academic institutions and the corporate sector.

The students are assigned a real-life case from the public or corporate sector that they work on for the entire 7-month period, alongside teaching within the hands-on, user driven innovation methodology Design Thinking. Each group is carefully put together to include at least one designer, one business person and one engineer. The groups receive support and guidance from coaches, who are there to help them with the practical progress of the work, and also the group work itself, i.e. dealing with the diversity within the group. This has turned out to be one of the biggest challenges the groups face, and something that we continuously strive to make easier on them. There is a lot of talk generally on how great cross-disciplinary teams are, and how important cross-disciplinarity is – however we seem to forget the difficulties involved in running these teams, and how most of them fail simply because of the differences between the team members.

We would be happy to share our experiences in creating such an executive program in collaboration between four different academic institutions, the difficulties we've faced, and why we believe we have succeeded. Not to mention the large effects we see both stemming from alumni all over the country and from the lowered threshold for cross-institutional collaboration between the different universities.

Collaborative placemaking - the city as an urban space innovation lab 1B-4: Kristin S. Næss, *Trondheim kommune*

Session 1C Symposium - Interprofessional education: INTERACT

Constructing Interprofessional Education: The case of INTERACT (Inter-professional Interaction with Children and Youth)

1C-1: Camilla Foss, Liv M. Guldbrandsen, Knut Løndal, Inger Ulleberg, Nina B. Ødegaard, Ingvil Øien, *OsloMet*

In this symposium we will present and discuss the project Interprofessional Interaction with Children and Youth (INTERACT) at OsloMet (<https://interact.hioa.no>).

INTERACT is a project on teaching and learning in higher education. Students in educational trajectories leading up to professional work with children, youth and their families are gathered in interprofessional courses and group-work once a year throughout the three bachelor years of their education. The aim is to enhance their ability to collaborate with other professionals of importance to a child's/a group of children's wellbeing, learning, development and/or health. Further, the students' ability to interact with the child/youth in ways that secure the child's/youth's right to have a say and to participate in the formation of everyday life organization as well as in specific measures concerning education, health or welfare issues, will be enhanced.

Students from the professional fields of education, health and welfare take part in INTERACT. The project is in an innovation phase and will in its full-fledged version comprise 7 – 8.000 students spread over three cohorts. We have just finished the first year

of a pilot version of this education initiative and see this symposium as an opportunity to present and discuss some aspects of it with experienced colleagues in the field of inter-professional teaching and learning.

INTERACT comprises three courses where students from the involved educations are presented for the same teaching, tasks and curriculum. Part of the work is carried out in interprofessional student groups.

INTER1100 (1.year students) is entitled 'The same child - different arenas', INTER1200 (2.year students): "Communication with children, youths and their families", INTER1300 (3.year students): "Interprofessional cooperation on and with children, youths and their families".

In the symposium we will present and discuss issues concerning the further development of INTERACT. The symposium contains three parts moving from

- 1) an overarching theoretical framework to
- 2) an investigation of case as a tool in this kind of education and to
- 3) a discussion of the students' collaborative, digital assignments at the end of the first INTERACT module – INTER1100.

1) From 'shared knowledge platform' to 'common knowledge'

Building competence in inter-professional collaboration may go on among practitioners in settings where a child or youth will benefit from coordinated measures. Anne Edwards's concept of common knowledge refers to processes going on in inter-professional collaboration across practices (Edwards 2012). 'Common knowledge' will serve as a conceptual point of entry in this paper. We will start with a presentation of Edward's concept, and then move on to INTERACT.

The curricula throughout the three years of inter-professional training comprises of three elements

- a. a shared knowledge platform
- b. explorative communication with children/youth and
- c. inter-professional practice involving children, youth and their parents

Even if each year of study have a particular focus, the elements are not isolated items but rather parts of an integrated approach.

In this paper the establishment of a shared knowledge platform will be the main theme. The paper will introduce the principles underpinning the construction of INTER1100, the first step in INTERACT's educational program. Then some subsequent questions will be addressed:

- Why should a shared knowledge platform be established?
- What may the content be and why?
- How could the learning design support students' appropriation of a shared platform?

Finally, we will elaborate on how establishment of a shared knowledge platform among students in higher education may promote development of 'common knowl-

edge' in post-qualified inter-professional practice.

2) Case-based teaching and learning in interprofessional education

To support the student's ability to collaborate with other professionals of importance to a child's/a group of children's wellbeing, learning, development and/or health, there is a need to develop teaching approaches enhancing interprofessional cooperation. Case-based teaching and learning (CBT/L) is an established approach to enhance skills in discussing complex, real-life situations. The method is learner-centered with interaction between participants to build their knowledge and work together in analyzing cases. Doing a literature review questioning case-based teaching and learning in interprofessional settings, will inform our educational project. We will summarize and explore the review with the following questions:

- What are the theoretical and pedagogical foundations for CBT/L in interprofessional education?
- Why is CBT/L a recommended approach in interprofessional education?
- How to construct cases of relevance for teaching and learning in INTERACT?

We will discuss how cases can be constructed and used to strengthen the theory-practice connection in interprofessional education.

3) Students collaborative learning through various digital assignments in INTER1100

In developing a learning design in INTER1100, we needed to decide what we wanted the student to be able to do (the objectives), what the students should be doing (the activities) and how the students should be assessed (the assignment). In order for learning to actually occur, each of these areas must compliment the other two (Biggs, 2003). An important learning approach in INTER1100 is collaborated learning. The students need to learn from, with and about each other to support the students' appropriation of a shared knowledge platform. The following work requirements must be approved:

- Participation in a seminar over 2 days
- Individually conducted observation or conversation with a child in advance of collaboration in interprofessional student groups

The collaboration was carried out in an interprofessional group of approx. 8 students. All group members presented their written notes for each other and chose a common theme based on their experiences as well as theories and concepts from the curriculum literature. Together they handed in a digital assignment through the LMS (Canvas). The students could choose between four different digital formats; written text, Pecha Kucha, digital story and podcast. We wanted the students to:

- Choose a format they preferred
- Have the opportunity to learn about different digital formats
- Increase their digital competence, incl. the use of tools, copyright etc.

We will present which format the students chose, why they chose it and how it affect-

ed the collaboration and the learning outcomes. This will be based on the students' self reported learning.

Session 1D Teamwork competences that support innovation

Integrating entrepreneurial skills in the course Experts in Teamwork

1D-1: Elli Verhulst, Nina H. Andersen, Thomas C. Espenes, Sigrid W. Brandshaug, Marte Konstad, *NTNU*

In the course Experts in Teamwork (EiT, the students develop teamwork skills through an interdisciplinary project. The course brings together Master students from all faculties at NTNU. Experience-based learning as a teaching method for EiT is in constant development, with the aim to provide students with knowledge, skills and attitudes that are important for futures challenges. Entrepreneurial methods can support students in the development of competences for the 21st century (Ananiadou and Claro, 2009).

A pilot study was done with the overall aim was to study how entrepreneurial skills can be integrated into the EiT course. Entrepreneurial methods were tested that can support the students capability to a) create value for society, b) involve relevant stakeholders in student projects, c) go through diverging and converging phases throughout the development process of the project, and d) go through cycles of iterations that are typical in innovation processes (Design Council, 2005; Lackéus, 2015; Plattner, 2010). These four elements are considered central in higher education as a preparation to working life. The selection of elements is based on a literature study and on needs from industry and higher education.

Three classes (so-called 'villages') in the spring of 2018 are part of the pilot study. This means that ca. 90 students spread over 15 interdisciplinary groups have applied and tested a selection of entrepreneurial methods trough different exercises within the early project phase. The exercises are research based, f.e. at University of Cambridge, and are adapted to the context of EiT.

Qualitative and quantitative data was gathered within the three villages, including observations of the teaching staff, focus group interviews with students, feedback from students and external partners, student reports, as well as data from EiT's student questionnaire.

The results from this explorative research project offers insights in how the entrepreneurial methods support the start-up stage of the EiT course. Moreover, the project

provides input to further develop the research strategy within the EIT section, as well as it offers ideas and insights on how the EIT course can support the development of competences that are important for futures working life.

Referanser

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How to improve interdisciplinary and innovation competences among bachelor of engineering students

1D-2: Hanne Løje, DTU

From society and industry, there are increasing demands for skilled and well-educated engineers who can develop new solutions through innovation and interdisciplinary teams that solve problems are necessary for creating successful innovation. Therefore, a central question is how to enhance interdisciplinary competences of engineering students in order to educate future engineers that can work in interdisciplinary teams and be able to develop new solutions through innovation. Consequently, many universities have recently developed interdisciplinary courses in the field of innovation. An interdisciplinary course will typically bring students together from different study programs and often it includes working with external companies to solve challenges provided by the companies. By engaging students from different study programs and place them into an interdisciplinary learning environment the idea is that they will make use of different viewpoints and difference competences in order to solve case problems for involved companies.

The scope of this study is to address the question “How to enhance the innovation and interdisciplinary competences of engineering students?” We will present a new mandatory course for Bachelor of Engineering students at the Technical University of Denmark (DTU) called Innovation Pilot. The outline for the course is that the students work in interdisciplinary teams to solve specific real-life challenges offered by exter-

nal companies. The teaching is based on a combination of e-learning, workshops and company collaboration.

The Innovation Pilot course is a 10 ECTS compulsory course in innovation and interdisciplinary and it is offered three times per year, twice in the semester periods of 13 weeks and as an intensive summer course of 6 weeks. At DTU there are 17 study programs involved, approximately 450 students from these study programs attend the course during each spring and fall semester and approximately 100 students attend the summer course. At the beginning of the course, the students are divided into smaller units of up to 60 students running at the same time in parallel. In each unit, teams are formed consisting of 5-6 students with a minimum of two disciplines present in each team.

Preliminary results from a survey regarding the students' innovation and interdisciplinary competences show that the course has succeeded in creating an understanding of what innovation is. However interdisciplinary is still difficult for the students to handle. In the presentation, more details about our experiences with teaching interdisciplinary student teams within the field of innovation will be present.

Jumpstarting interdisciplinary collaboration with Design sprints

1D-3: Vidar Tilrem, *Kantega*

How to fail with design driven innovation?

1D-4: Bjørnar K. Reinertsen, *FARA*

Thursday 21 June, 13:45 - 15:15

Session 2A Educating for interdisciplinary teamwork skills

Rethink EiT 2017 at business academy Aarhus - Co-creation of common practice for master facilitators and tools for facilitation

2A-1: Lea Sørensen, Susanne Ø. Olsen, Mette R. Olsen, *Business Academy Aarhus*

The oral presentation is an experience report that presents findings from Experts in Teams 2017 at Business Academy Aarhus. The concept for Experts in Teams is inspired by, and has been developed, in collaboration with NTNU. The aims of the course are

that the students:

1. Become experts in teamwork
2. Learn how to work interdisciplinary within the team
3. Try out a practice-based innovation process.

The facilitators are all lecturers at Business Academy Aarhus. Contrary to their normal role of teaching, in Experts in Teams, the lecturers must have knowledge of and be capable of handling as well innovation processes as team processes.

The underlying assumption is trust in the students' ability to master the innovation process with a minimum of intervention. But what about the students' ability to master team processes? Are they capable of self-facilitating their team processes? Is it necessary to rethink our practice?

Facts about EIT 2017

- Extra-curricular activity
- 100 students from different educational backgrounds and nationalities
- Facilitators are all lecturers from the Academy
- 6 master facilitators + 12 practitioner facilitators
- 3 villages, each with 5 teams of 5-6 members
- A company specific challenge under the headline "sustainability" in each village
- 2 observers

The presentation describes the experiencing process of designing and co-creating a common language for facilitating at Business Academy Aarhus. The purpose was to develop the facilitating approach and methodology in experts in teams, in order to generate insights that enable us to develop and improve our facilitating practice. The core of the presentation is the level of meta-reflection, we have included in the course for the facilitators. It will be illustrated by our systematically work with a action learning methodology, take aways and disturbance from NTNU's facilitation course and the formal and informal evaluation. That brings to the learning points:

- #1 A need for more tools for facilitating teamwork and team processes
- #2 Students need tools for self-facilitating
- #3 A need for structured reflection tools and visualization of the value of reflection
- #4 Importance of diversity in teams
- #5 Success of team process must be evaluated
- #6 A need for explicit success criteria and goals

In addition, we have experienced the value of reflection during and after the workshops among the facilitators. This and the 6 findings will be integrated when developing the concept for EIT 2018.

Supplementary Instruction - a student-active learning form

2A-2: Roger Helde, Elisabeth Suzen, *Nord universitet*

Supplemental Instruction (SI) is a student-active learning form that Nord University has used since 2004. SI is a voluntary offer of professional guidance under the guidance of the students themselves. SI is about collaborative learning, emphasizing the importance, guidance and reflection of relationships as a method and tool for learning. The purpose of SI is to improve student performance and reduce student interruptions through collaborative learning strategies.

Background for SI

SI was developed in 1973 by Dr. Deanna Martin at the University of Missouri in Kansas City, and has spread to over 1,500 universities and colleges in nearly 30 countries. The background for SI was the desire to develop a measure to strengthen the passing rate at some courses at the university, and a teaching program was developed that favors everyone.

Why SI?

The purpose of SI is to provide students with a better opportunity for understanding and knowledge in difficult subjects through an informal collaborative learning environment. The students are supervised by a student who has recently completed an exam in the relevant subject. The main function of the student who is the SI leader is to facilitate discussions among SI participants and model successful learning strategies at key moments in the SI sessions. This means a SI leader who during the work develops interdisciplinary teamwork skills among the team.

How can SI contribute to learning?

Research shows that SI has both improved academic understanding and the student's exam results. At Nord University we have conducted a study where we focused on the students who also lead this offer. The issues we sought to answer were: How did the SI leaders understand and experience 1. SI as educational tools and 2. SI as a management development program? And can we see a connection between participation in SI and the exam result? Finding from our qualitative study, SI leaders knew SI as a support in the students' learning, which is confirmed in findings from participation in SI and the exam results. In addition, SI acts as a management development program for SI leaders, which gives them the opportunity to develop as future leaders and facilitators of learning processes.

'Teachers in Team' – facilitating student teachers' reflection on teamwork skills

2A-3: Ela Sjølie, Alex Strømme, Juliette Boks-Vlemmix, *NTNU*

Interdisciplinary teamwork skills are increasingly important in today's schools. First,
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collaboration is seen as important in relation to teachers' professional development and also in school development (Kennedy, 2014; Opfer & Pedder, 2011). This implies that teachers need to be able to work in teams, both within and across disciplines. Second, teachers are expected to teach their own pupils teamwork skills, through collaborative learning activities in the classroom. There is broad agreement that the development of collaborative skills in school is important, and also that collaborative learning as a method leads to deep learning and understanding. Nevertheless, many classrooms around the world are still characterised by individual learning activities and assessment, or by group work without the focus on learning how to collaborate. For pupils to develop collaborative skills through group work, teachers themselves need to have developed a language to talk about collaboration. Despite this "double" importance of teamwork skills for teachers, the topic is not sufficiently addressed in many teacher education programs today.

In this presentation we will report from a case study that aimed to enhance student teachers' teamwork skills, while also enhancing the students' awareness of their own role in facilitating group work processes in the classroom. One year cohort of 120 student teachers were followed in a group-based project, in which the students conducted an R&D project during their practicum in school. In collaboration with Experts in Team at NTNU the students were presented with theory on group dynamics as well as participated in student active workshops. The main focus was the concept of facilitation, giving and receiving feedback, and various tools for reflecting upon the collaboration, individually and as a group. Quantitative and qualitative data were collected, and the quantitative data were compared with a student cohort that conducted the same R&D project but without the intervention described as the case study.

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Giving and receiving feedback: how hard can it be?

2A-4: Gunhild Roald, Ida M. Gabrielsen, *NTNU*

The ability of team members to give and receive feedback is crucial if teams are to perform at a high level (Keagan & Lahey, 2001; McClure, 1998). Gaining experience and training in both giving and receiving feedback is therefore an important part of the Experts-in-Team (EiT) philosophy (NTNU, 2018). However, at a relational level, the feedback process might be complex and fraught with risks (Weisinger, 2000). Even with the best of intentions, be it of assisting another person in his or her development, or be it of improving group dynamics, negative feedback has the potential to aggravate and destroy a relationship (Weisinger, 2000). On this background, it is suggested that

the way a verbal feedback is expressed is important when it comes to protecting the self-esteem of the receiver of the feedback, and maintaining and developing the relationship between the giver and the receiver (Keagan & Lahey, 2001; Weisinger, 2000).

In the Experts-in-Team village Lev & Lær, which is anchored in the Department of Education and Life-Long Learning at NTNU, the students are challenged to give feedback according to a particular procedure. While naming behaviors that they appreciate about each of the other team members, the students are challenged to elaborate on how this particular behavior makes them feel, and on giving a concrete example of a situation where they have seen this behavior expressed by the other person. The next step is to point at a behavior that they would like to see more of in each of the other team members, followed by a specification of how this might make the giver of the feedback feel, and an example of a situation where this behavior might have been expressed by the receiver of the feedback.

Rather than criticizing behaviors that one does not value, one is, in other words, challenged to positively reinforce behavior that one appreciates and that might be developed by the other person (Weisinger, 2000), for the potential benefit of the relationship and the team. In this way, principles of deconstructive feedback (Keagan & Lahey, 2001) are implemented, in terms of underscoring the subjective and relational dimension of the feedback process.

This study is based on five focus group interviews with a total of 28 students who have participated in Lev & Lær, where the undersigned have been working as village leaders. The interviews are identical to the mandatory “perspective conversations” between the village leaders and the groups, where the experience of giving and receiving feedback has been one of the themes addressed. The parts of the conversations that focus on feedback have been recorded, transcribed and analyzed, inspired by the principles of phenomenological-hermeneutic analysis suggested by Lindseth and Nordberg (2004) and Smith, Flowers, and Larkin (2009).

An important finding is the experience that small nuances might be of importance, particularly in terms of what it feels like to offer a critical verbal feedback to another person. Students express that the idea of reinforcing behavior or skills that one appreciates is new to them. Moreover, they experience an immediate usefulness and applicability in the suggested way of expressing critical feedback, in terms of having tested elements of the procedure in private conversations in relationships outside EiT during the village period.

In this presentation, the principles behind the feedback procedure suggested above and the findings of the study will be presented more thoroughly and discussed in relation to feedback research. Questions will be asked as to whether one might be too cautious and afraid to “step on each other’s toes”: Why not just say it as it is? How hard can it be?

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Session 2B Collaboration between higher education and work life

A student perspective on collaboration between higher education and work life

2B-1: Marte Bonnegolt, *NTNU*

Challenging the curricular framework through guerrilla pedagogy and pedagogic intrapreneurship

2B-2: Knut Boge, Petter Øyan, *OsloMet*

We are pleased to be challenged to reflect about our experiences and to participate in the discussion. Since 2004, we have broad experience from introducing and executing a series of multidisciplinary and multinational learning events that supplements and challenges the traditional curriculum. Some of these events have been common projects involving both authors, other have been individual. All projects have been developed and executed in cooperation with industry partners. Students involved came from a broad range of national and international educations. Some of the events also involved international teachers or other internationalisation activities. Common for all projects is that they are organized as supplementary events or part of our standard curriculum, and transfer participating students and teachers out of their comfort zone and into an entrepreneurial mode.

The projects have been executed at Akershus University College, Østfold University College, Oslo and Akershus University College of Applied Sciences, and OsloMet – Oslo Metropolitan University, in collaboration with numerous international academic partners.

Challenges faced

Challenges within the institution for higher education to establish (extra-curricular) activities. Recruitment of students with an entrepreneurial mind-set to projects that are part of the ordinary curriculum or extracurricular activities. Need for several equally challenging and interesting project alternatives to provide a choice of projects. Building the team, involvement of colleagues and stakeholders. Recruitment of business partners. Facilitation of the process for student active learning and reflection, and development of entrepreneurial mind sets.

Approaches taken

Personal initiative and motivation combined with curiosity, learning focus and thorough preparation. Selling the idea to internal and external stakeholders, and anchoring the undertakings within our own academic institution. Involvement of students in the complete process, and handing over responsibility to students.

Observations, experiences and reflections

Challenging the curricular framework through pedagogic intrapreneurship and guerrilla pedagogy by introducing unconventional events that adds value to the established curriculum. Workshops and project work has been integrated in traditional educational practices as compensatory measures, to improve and increase the students' learning experiences. Our experience is that this educational setup drives the students' learning stronger than traditional lectures. The students experience an extraordinary steep learning curve through problem based learning in practice, and develop their entrepreneurial skills and mind-set. Students and teachers involved also develop their network across educations and professions, with industry partners and foreign academic institutions.

Corporate and students - When TrønderEnergi met Entrepreneur students from NTNU

2B-3: Aleksander Nybøle, *TrønderEnergi*

Student contributions to accelerate regional business transformation – the green transition

2B-4: Per-Erik Sørås, *Trøndelag fylkeskommune*

Session 2C Interprofessional education (healthcare)

Interprofessional learning in practice; alignment with the workplace

2C-1: Anders Bærheim, Reidun L.S. Kjome, Tiril Grimeland, Ane Johannessen,
UiB

Sissel J. Brenna, *HVL*

Bakgrunn

Senter for tverrprofesjonell samarbeidslæring (TVEPS) lar tverrprofesjonelle team av siste helsefagstudenter skrive en tiltaksplan for et par pasienter som de har undersøkt, og presenterer denne tiltaksplanen for arbeidsplassens ansatte i et dialogmøte.

Hensikt

Hva er læringspotensialet i denne samarbeidsaksen mellom utdanningsinstitusjonene og helse- og omsorgsarbeidsplassene i kommunen?

Metode

Gjennomgang av studentteamenes tiltaksplaner 2015-2017. Studentenes refleksjonsnotat over egen læring. Samtaler med ledere og ansatte i kommunens helse- og omsorgstjeneste.

Resultat

Studentene beskriver å lære om hverandres kompetanser, lære å arbeide sammen i praksis mot et felles mål – pasientens beste.

Studentene foreslår som endret pasienthåndtering

- Pasientens ressurser og selvstendighet (samtaler, trygghet, rettigheter, omsorgsteknologi, tilretteleggelse hjemme og på sykehjem, rehabilitering)
- Kraft og evne til bevegelse (trene generell eller trening av spesifikke funksjoner)
- Somatisk helse (risikoutredning, ernæring, metabolsk kontroll, smertestilling, affektive lidelser, lungetrening, tannhelse, hygiene/hud/sår)
- Medikamentell behandling (medikamenter uten indikasjon, dosering og bruk av medikamenter, interaksjoner, medikament på liste som ikke brukes)

Kommunens ledere og ansatte fokuserte på

- Mange nyttige innspill fra studentene
- Nyttig å kunne samles og bruke god tid på å diskutere enkeltpasienter
- Nyttig med den kompetansen studentene representerer og som ikke alltid finnes på arbeidsplassen.
- Studentenes tverrfaglige arbeidsmåte er inspirerende

Konklusjon

- Studentens læringsaktiviteter gir pasientnær læring på arbeidsplassen for de ansatte
- Ansatte tar møtet med studentene inn i sin felles arbeidsplan
- Bedre behandling / omsorg for pasientene?
- Hyppigere dialoger mellom utdanningsinstitusjon og kommunehelsetjenesten

Does the nature of interprofessional education in health and social sciences foster a need for special tutor competencies?

2C-2: Nanna Hauksdottir, Anita Iversen, *UiT*

The aim of this presentation is to direct attention to new requirements for tutors facilitating interdisciplinary student groups.

The role of a tutor in ordinary student group work is relatively well-explored and the requirements needed to facilitate efficient group processes are known. The same does not apply for the role of the tutor in delivering effective interprofessional education (IPE) (Reeves et al., 2016).

Background

Tomorrow's health and social services require change to meet challenges with demographic changes and professional work force. Health- and social care professionals need to work cleverly in collaboration with patients and clients to improve healthcare outcome. Higher education must offer IPE to prepare all students for interprofessional collaboration. IPE has been defined as occasions when two or more professions learn with, from and about each other to improve collaboration and the quality of care (WHO 2010).

Attention to the contextual factors

IPE- groups are complex by nature and are recognized by:

- Students from different health and social professions (medical, PT, OT, nursing, dentistry, social work etc).
- Patients needs and wishes are main focus of attention.
- Learning about sickness and health, assessment and treatment, and learning with each other, from each other and about each other.
- Students need to pay attention to each other and each other's competences.
- Problem solving requires students' reflection and analysis of similarities, differences and the value of different contributions to a common solution for the patient.
- Stereotyping of roles, professional struggles and questions about power and hierarchy in the health and social sector is existing factors, also among students.

Attention to tutor experiences and strategies

Experienced tutors will recognize the challenges seen in ordinary groups and additional factors may influence their role in IPE:

- A need of increased security among students that by himself represent a profession.
- Students need to see each other, to show interest in each other's profession and professional contributions.

- Promote students' ability to create common solutions, where professional boundaries are outlined and used in an innovative way.
- Development of mutual respect between students in collaboration with patients to improve professional practice.
- Variation in different interprofessional teaching approaches to encourage effective student learning.
- Role modeling – values and ethics

Concluding comments

Lack of evidence support a need of extended research of the tutor role in IPE to identify areas for professional development.

Interprofessional psychogeriatric educational practice - the importance of professional boundary crossing to improve collaboration

2C-3: Anita Iversen, Rita Jentoft, *UiT*

Interprofessional collaboration is an important means to improve health services for people with long-term and complex conditions who are in need of coordinated care. This interactive research of educational practice set focus on student's experiences with interprofessional collaboration within a Geropsychiatric Outpatient Unit. The participants were six final year students from Medicine, Occupational- and Physical Therapy divided in two teams. Each team visited elderly patients living at home with the following learning objectives: 1. Establish rapport, assess needs and wishes with the patient. 2. Consider suitable initiative to evaluate risk factors and enhance quality of life. 3. Write common health reports documenting both professional and interprofessional evaluation.

Two IP supervisors and clinician followed and documented the whole process. Fieldwork method were used when the groups planned and carried out two home-visits. Focus group interview were conducted immediately after each home-visits and finally with all participants six weeks later. Information were audiotaped, coded and thematic analysed within NVivo.

The students acted inter-professionally, expectant and humble with the patients. They examined and obtained knowledge of themes like depression, anxiety, pain, fall incidence, quality of life, independence for daily life and social participations. Collaborating enlightened mutual and in depth perspective of patient's goals and everyday life, their functional and medical condition. By active observation in other professional assessment and collaboration with the patient, boundaries were crossed and unexpected learning occurred. However, several students expressed uncertainty to own professional performance and initiative. New insight occur when students challenged each others professional identity and values. Writing health record together enabled

students to reach a common ground, and to strengthen confidence in professional and interprofessional capabilities.

Working with elderly people with severe health challenges gives both professional and interprofessional valuable learning. The diversity of the patient setting along with the exploratory nature of the project challenged the students' professional boundaries and comfort zones. The students found knowledge from collaboration of major importance for learning, enhancing quality and effectiveness for health services. It is important to expand time for interprofessional practice during health studies education.

Session 2D Challenges in interdisciplinary teamwork

Interdisciplinary teamwork in the DigiFab project – the journey from start until now

2D-1: Ingvild Jensen, *Q3 Partners AS*; Elli Verhulst, *NTNU*

Interdisciplinarity is often seen as something that is very important for successful innovation projects, but in reality, it shows that it also brings challenges to teamwork. In our presentation, we will share some of our experiences with interdisciplinary teamwork cooperation within the project DigiFab.

DigiFab's main goal is to develop a method that brings SME companies to Industry 4.0. By analysing the current situation, we will evaluate the digital maturity of the company and its production. Furthermore, this 'digital maturity' will form the basis for the company's roadmap to Industry 4.0. The roadmap shows the company how it can develop itself through the use of digital technologies, changes in business model and development of the needed business capabilities and competences, in order to reach an Industry 4.0 level.

The DigiFab project group was formed within three days at Fornebu under the initiative of the Research Council of Norway (1), in pure reality show style. 28 energetic, interdisciplinary and competing souls worked together for three days to develop innovative ideas about digitizing Norwegian industry. Six of the participant (see below) eventually found each other, formed a project group and developed a project idea. The result was the innovative "DigiFab" project proposal, which won the first place (mnok 4.5, total frame mnok 9). The interdisciplinary composition of the team got mentioned by the jury as one of the criteria that strengthened our project proposal, next to the content of the project idea. The project team brings together experience from the following disciplines: a) Entrepreneur with background and practical experience in strategic management, b) research manager at Sintef with background

in digitalisation and big data, c), associate professor at NTNU with background in interdisciplinary teamwork and industrial design, d) associate professor at OsloMet with background in robotics, e) research manager and industry coordinator at Sintef Raufoss, and f) entrepreneur with background and practical experience in optimisation of production systems.

Highs and Lows in the first year of interdisciplinary teamwork in the DigiFab project is the theme of our presentation. The presentation will elaborate more on what has been going well, how and why. Also what is going difficult in the project, why and how will be discussed. Finally, we will conclude with lessons learned, measures and the way forward. The experiences from the project up to now show how the interdisciplinary expertise of the team members makes it possible to create a systemic overview and come with innovative solutions that bring together knowledge and expertise from technological, strategic, managerial and human perspectives. Simultaneously, the different backgrounds, experiences and working approaches ask for sufficient attention within the project, which slow down the progress in the project. Some examples thereof are the different way of working (research oriented versus business oriented), differences in language and terminology within the different disciplines, etc.

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Creativity and structure in teamwork - a new course design for deeper learning outcomes

2D-2: Anette Oxenswårdh, Per-Arne Forsberg, *Uppsala universitet*

Purpose

In this paper a new course design as a case study is presented. The course was given on bachelor level at Uppsala university, campus Gotland, within the division of Quality Technology. The purpose of the new course design was to give students an opportunity to practice acquired theoretical knowledge by offering them to create an organization of their dreams, working in small groups, in-line with agile principles and values. To enhance and deepen the students' learning process in the course, they were offered broadened knowledge of organizational aspects and cornerstones within change management, using a number of themes and agile project management methods.

Methodology

This paper builds upon case study approach, combining a literature review, document studies over the performed course and evaluations over the course.

Findings

The case study shows that course design can be an important inspirer and a bridge between theory and practice for students. Course design seems to support students' learning processes according to evaluations of the course. Course design offers benefits of the collective learning, especially for distance students. It increases independence, understanding of one's mission and responsibility for it. Students are given the opportunity to practice the theoretical knowledge in their education in a creative and inspiring way. Group processes sharpen their own tools and support individual and collective learning. The demands of study in using scientific articles as a course literature, also seemed to prepare students for a bachelor degree, which was planned to be a course following this course. Still, there are further demands and challenges left of improvement, in the course design.

Practical implications

This paper gives an example of how one university course can be designed in order to create deeper understanding for organizational change in an agile setting.

SULITEST – Sustainable Literacy Test. A measure for teaching sustainable development and interdisciplinary teamwork. Experience from NTNU

2D-3: Charlotte S.E. Teigen, John E. Hermansen, *NTNU*

The UN Conference on Sustainable Development (RIO+20, 2012) initiated the work with the Sustainable Literacy Test (SULITEST) among the UN Higher Education Sustainability Initiative (HESI). A group connected to Kedge Business School, Marseille took the lead in the development and organization of the test. The launch of the UN Sustainable Development Goals (SDG) and the Paris Agreement on climate change in 2015 further emphasized the importance of the role of higher education in developing student awareness of sustainability challenges and transformation, and the need for global measures for promoting higher education towards sustainable development. HESI has encouraged universities to teach sustainable development (SD) across all disciplines of study, research and dissemination of SD knowledge, campus greening, and engaging and share information with international networks.

In June 2017 the UN High-Level Political Forum on Sustainable Development encouraged and supported the use of SULITEST, and encouraged to develop the test further as a measure for motivation, learning and test of SD knowledge available for all students in the World. The SULITEST organization asked the question: "How can we assess

and report on sustainability's impact in our programs and be sure that we are producing sustainability literate graduates?". They designed the SULITEST to measure and improve sustainability literacy as internet based on a multiple choice test available for students worldwide. SD and Sulitest are ultimate interdisciplinary. The Sulitest knowledge based matrix includes a number of subjects within the following themes: Sustainable humanity and ecosystems on planet Earth, Global and local human-constructed systems to answer people's need, transitions towards sustainability, and mindset and roles to play in order to create and maintain individual and system changes.

As committed to SD research and education NTNU also need measures for motivation and test of SD skills among students. The presentation explains how SDG and Sulitest create a common platform for all disciplines and the interchange of knowledge between disciplines. The SDGs are not only negotiated with concerted goals. They are subject to mediation, negotiation and dissemination between subjects, actors and interests, and between knowledge, the use of knowledge and the driving force for change. Experience and results from pilot tests at NTNU especially from Expert in Teams villages, will be presented and the relationship between learning goals, NTNU environmental goals will be discussed, and how Sulitest can be used for international comparison. The presentation will also address how the test can be adjusted to different countries and study programmes, Mediation between interdisciplinarity and the course of acting will be discussed.

Archives and libraries brought into the 21st century through interdisciplinary teamwork. Lessons learned and challenges to reflect upon.

2D-4: Alexandra Angeletaki, *NTNU*

Museums, libraries and institutions of memory have been challenged to find new forms of dialogue with their users and have turned to current technology to entertain and inform their audience. The demand thus for the library professionals is to bring their libraries and archives forward to the 21st century by integrating new technologies to deliver knowledge and participate in interdisciplinary international research. The main focus of this paper is whether the introduction of interdisciplinary work teams in dissemination practices has led to a change in the experience of the contemporary museum-archive perception. By using the case of the library in Trondheim and the projects, I have organized and managed since 2012 until today for the University library of Trondheim, I will discuss the challenges on integrating technology tools in archive and repository dissemination and the value of working with interdisciplinary international research teams.

Mubil and ARK4 projects were established by NTNU University library as interdisciplinary collaborations with international partners from Italy, Greece funded by the National library of Norway and NTNU university. 3D technology workshops, gaming and mobile technology was used in the "Mubil lab" in order to develop open access

educational workshops for University students and schools with source material drawn from archives and museum objects.

ARK4 is an ongoing project that focuses on archaeological context, and in collaboration Digital Curation Unit Athena RC and Europeana Research and has been experimenting with user interactivity, digital technologies and gaming. The broader impact of our study contributes to the discussions on issues pertaining to educational activities from the users' perspective.

Our collaborators in both projects brought expertise from IT, Museum studies, Art design, Software engineering and Educational design. The workshops were organized in three countries Norway, Italy, Greece and our results were presented to many university students and Museum and library professionals in Norway, Spain, Austria, England, Greece, Italy and Qatar.

The work that will be presented here is based on a set of practices and design methods whose core philosophy is to include end-users as active participants in the design process and reflect on how we interact, work and learn in the context of a targeted activity, through observation, discussions, and teamwork so that a concrete idea is produced.

Our research considers learning as a process of sociocultural character (Ienhart and Knudson 2014) and the visit to a library an experience that starts with the visit but continues in the imagination of the user(Hooper-Greenhills 2000).

Our main hypothesis was the projects presented here have drawn to our library new user groups as school classes and university students as our experts and allowed active involvement and social interaction to be the carrier of knowledge with the help of technology. Our investigation has focused on whether we can embed scientific inquiry and gameplay in museum and library workshops to build an understanding and form strategies to approach digital technology in outreach activities and experiment with new ideas created by the students themselves.

Presenting and discussing our research in international fora through conference participation and workshop activities for professionals and university students has allowed us to reflect upon communication skills and the methodology evaluation challenges posed by international interdisciplinary projects collaboration. The experience we have collected through our research has been a leading force into further development of critical analysis and evaluation methods so that we can establish a 21st century archivists kit and strengthen our role as professionals in the future.

