

LMU Prosjekt 2018-19

Økt gjennomstrømming på UiTs Ingeniørutdanning

Ved IVT-fakultet: Campus Narvik, Alta, Mo i Rana, Bodø



Prosjektleder

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i NARVIK

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1. Project application

Project Aims

The main aim of this project is to reduce student dropout amongst students studying for a bachelor degree in engineering. We can facilitate academic activity in key subjects by improving the students' study experience and sense of achievement in their first year of their studies in engineering. In this manner, we hope to ensure that students not only complete their degree, but that they are also encouraged to carry on at the same institution and help recruitment internally from prequalifying student groups.

The Challenges

Back in 2010, an initiative was started to open up Narvik's Bachelor studies in engineering (then Høgskolen i Narvik) to potential students who, for personal reasons or geographical location, were unable to attend lectures on campus.

This initiative involved video streaming of live lectures which were held for campus students. Internet-students could then either follow lectures live or watch recordings afterwards.

When campus students found out that they had access to recordings, they realised that they did not have to turn up to lectures.

We have discussed the possibilities of cutting out live recordings altogether and recycling earlier recordings for Internet students. But then we have campus students (ca. 200 of 350-400 students in total) who have expressed that they think recordings of the live lectures to which they have been themselves, are very useful, especially for exam preparation.

We have set up extra homework help 2 hourly sessions, thrice weekly in the autumn. We reduced this to twice weekly in the spring as we found that very few students were attending and that the few times attendance was a little higher was when there was an obligatory assignment.

The consequence of publishing recordings of lectures has been a sad and steady depletion in the number of students on campus, in Narvik. The numbers of students who work together in smaller groups has reduced over the years. This has a roll-on effect – the fewer students there are on campus, the lower the motivation of turning up in an auditorium with just a handful of fellow students. The students we observe to be collaborating/ attending classed are the ones who have had been 'forced' to come to school earlier – forkurs students, 3-semester students and foreign students who attended the local language course.

Compulsory attendance is part of the pre-bachelor studies for these student groups and has shown to be an advantageous factor that they have taken with them further into their bachelor studies.

Objective 1: Increased campus attendance

Measures/ Changes:

- As part of this objective, we have changed the subject description (emnebeskrivelse) to include obligatory attendance for these practice sessions - øvingstimer.

- We have also removed the possibility of taking a second resit without doing all obligatory assignments again. This is because we have observed that students who have failed earlier, use up examination attempts without bothering to do the necessary work to help them to pass.

Extra sessions: This involves collaboration with administration and the timetable coordinator. There are already challenges finding timetable slots that are available for the different types of engineering studies. Students will also need to be split up into groups according to their chosen field of engineering.

We hope to set up 5 parallel sessions in 5 different classrooms in Narvik – twice a week (1 hr 30 mins), sometime between 08:15 and 16:00. Four of the classrooms will be dedicated to campus students, and one will be a virtual classroom for internet students.

- Classroom 1: Bygg
- Classroom 2: Maskin, Prosess
- Classroom 3: Data
- Classroom 4: Elektro/ Satellitt
- Classroom 5: Nettstudenter – all internet students

Lecture attendance can also be administered by using a card scanner. Internet students will be called in to obligatory Skype-meetings. They also have obligatory study weeks on campus which can be utilised to a greater degree than they are today. This grouping will also advantageously facilitate integration with other campus students in the same field.

Objective 2: Increased relevance for engineering fields

Part of the mandate of teaching assistants will be to administer exercises in mathematics, physics and statistics which are relevant to their particular student group.

- Autumn term: Matematikk 1 (10 stp), Statistikk (5 stp)
- Spring term: Matematikk 2 (10 stp), Fysikk 1 (5 stp)

Lectures covering these subjects over two semesters will be very similar to today's lectures. But these classroom lectures will allow the students to apply theory in their specific fields. References to lectures and to books instead of detailed solutions will also help online students cross-reference the material that has been covered in lectures.

This will also open up the possibility for collaboration with other colleagues in the respective fields if individual projects related to these core subjects can be suggested and administered by field specialists. However, this would require extra resources from each engineering field.

Objective 3: Increased degree of inter-student collaboration and recruitment to master studies

Students with a common interest shall be encouraged to solve problems individually and in groups. Although they are obliged to attend these sessions, twice a week, the idea is that the positive experiences they have here, will encourage them to take the initiative to collaborate in their other subjects through the rest of their studies.

Students who complete their Bachelor degree with a good grade will often want to take their studies further at the more prestigious engineering institution, NTNU. If the students have found good

collaborators among students during their Bachelor studies, we hope they will wish to continue to study with the same students together at Master level in Narvik.

Objective 4: Reduce student drop-out

We experience that some students experience both personal and financial problems drop out from their studies altogether. They often ask for help at the last minute, when it is often too late to do something about their problem or not at all. Communication channels between the teaching assistants, the student advisor and the study coordinator will be set up. Poor attendance, information about assignments not submitted will be reported in to the study coordinator and/ or student advisor. We might then have an opportunity of helping a student in difficulty before their situation worsens.

The role of the teaching assistant is three-fold:

- 1) For each study group: Help to find and administrate relevant exercises (individual, group, theoretical, practical) that require understanding theory from lectures and putting this into practice – publish, make solutions, give feedback
- 2) Document academic progression (e.g. progress with assignments) in mathematics 1 and statistics (autumn), mathematics 2 and physics 1 (spring). Update online data for student attendance/ dropout/ activity in Canvas.
- 3) Collaborate with the study coordinator who will be encouraged to put students experience difficulties in touch with the student advisor if it seems they have personal problems.

Objective 5: Recruitment to bachelor engineering

Evening sessions for help with homework for all student groups will also be set up twice weekly.

Forkurs students will also be invited to these so that they have the opportunity to mix in with the larger community of bachelor students. We also find that some of our forkurs students prefer to apply to other institutions (NTNU amongst others). By mixing these groups we hope they will be encouraged to apply locally in Narvik instead and take advantage of a familiar and active learning environment.

Resources required

Staff

- 1 project leader
- 1 teaching assistant
- 5 student assistants

Equipment

- 3 PCs: shared Online help, administration/ input of related data
- Books & calculators – copies/ items for all related personnel for parallel classroom use
- Card scanner – for registration of lecture attendance

Key dates

- Staff recruitment: June – July
- Collaboration: Administration: timetable, Canvas – student grouping, Study coordinator, lecturer, teaching assistant, student assistants
- Midway evaluation with suggestions for adaptations for semester 2 – 22nd October
- Registration of examination results – 15th January

- Evaluation of semester 1 and further adaptations for semester 2: 31st January
- Registration of examination results for semester 2 – 15th June
- Final report 30th June.

2. REPORT – part 1

Aims of the Project

Objective 1: Increased campus attendance

For this project, I analysed the timetables of the first year students for the different studieretninger and calculated that, in addition to the 3 lectures in mathematics they had weekly, they had the capacity to take on an extra session a week. The 'øvingstime' was to be held in a classroom instead of the auditorium where they had lectures.

Emphasis was placed on the fact that attendance for 'øvingstime' was obligatory. It was important that we had anchored this in the course description (emnebeskrivelse). Students who were repeating the course needed to be referred to this revision.

Compulsory attendance is not common at University level and as a rule, attendance at lectures at UiT is not compulsory. However, scanners were purchased for the purpose of registering attendance at the start of mathematics lectures for bachelor students.

Students were understandably sceptical to the scanning at first and wondered if attendance was obligatory. They were told that even though they did not have to attend lectures, they were monitored as part of a scheme to find out which students were not coming to classes and to provide us with the opportunity of following up students in difficulty. We would then be able to put them in touch with a student advisor (studentrådgiver). This reason was plausible and accepted.

A positive byproduct of the increased attendance in Mathematics 1, was the marked increase in numbers attending lectures compared with recent years, noted by other lecturers for the same student groups

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Obligatory practice sessions

The students were split up into groups according to which engineering speciality (studierening) they were to qualify for. We had 4 groups according to their chosen field of study and earlier student numbers: Bygg, Data, Elektro, Maskin & Prosess

There were not as many campus students as we had anticipated compared with the previous year. In some studieretninger, the number of internet students heavily outnumbered the number of campus students. Because of this, we reduced the number of campus groups from 4 to 3. Separate internet meetings via Skype were also set up for internet students.

The initial reaction to these extra sessions and extra tasks was surprisingly negative if not a little aggressive.

I had assumed that it was only first-year students that took this subject. However, in addition to the 'ordinary' students and those taking re-sits, there were also second year Y-vei students. They looked upon this additional session as an extra burden in a timetable that was already full.

(Ordinary students often have relatively little teaching in their first semester)

Even though they had just completed their foundation course in mathematics, Y-vei students were still much 'weaker' in mathematics than the ordinary students.

When left to themselves, the group work was dominated by those who could solve the problems while the 'weaker' students looked on, feeling somewhat 'stupid'.

An aim of the project was to get students with the same interests to get to know each other better by grouping them together and getting them to solve tasks together.

The first tasks were given to test expected prior knowledge. As many of the text books used in the Engineering, some tasks were also written in English to test and train ability to solve exercises written in English.

Y-vei students said that they had already formed their alliances amongst themselves and were not interested in socialising with new students. They had adopted a 'strange' way of struggling through their first year of mathematics, explaining that most failed their exam on their first attempt but then worked really hard to pass the resit(s).

In any case, after explaining that we meant well, we persevered with each other and I made adjustments to the questions in order to take account of these difficulties that arose. In time, the same aggressive students came to enjoy doing these extra questions and even asked for more. This was encouraging.

In each of the weekly sessions, the student assistants handed out exercises and went around and helped students.

We made several discoveries, including the sad fact that older students who had taken the course the year before. 'sharing' answers to earlier assignments.

In the second term, for the Mathematics 2 course, we made changes including student follow-up by dedicated student assistants. This continuity allowed the student groups to have more confidence and trust in the same student assistant who helped them on a weekly basis during the previous term.

The teacher for Matematikk 2 had a lot more exercises, so these were used instead, as the tasks for the weekly sessions. In addition, we substituted some of these obligatory sessions with tests.

We noted reduced attendance in lectures when we did not scan/ monitor lecture attendance.

Over both terms, we felt that there was the general positive effect that campus students could identify themselves as part of a group interested in achieving the same type of engineering qualification. Academic activity between students was supplemented by personal interaction with a student assistant on a weekly basis.

Learning from experience – an improved third term (autumn 2019)

We learned a lot from project activity in the 2018-19 academic year and have used this to revise the structure of the extra session. Naively I assumed I could use funds saved from the first year, to finance an øvingstime and for students for the following academic year.

Better controls over students used to 'cheating' regarding attendance and ability to provide feedback more quickly, and send students reminders at an earlier stage if we don't hear from them. Either way, we will expose the students to more interaction with each other/ student assistant.

All sessions are plotted in in Canvas as 'assignments' so that attendance/ non-attendance is as visible to the student in Canvas as any conventional assignment with a deadline.

The campus is undergoing refurbishment and space is limited, so we are using the kantina to mix all student groups together. Because of timetable and room logistics and limitations, they are given 3 time slots to pick from.

There are several factors that have made this term's setup much more successful than last year's:

- The timetable planner was able to categorise the students into both place of study and engineering program (studieretning)
- I am known to the students taking mathematics – from forkurset, those from Y-vei
 - They have been coming into my office and asking for help to solve homework. This has given me the ability to tailor the questions on the weekly tasks according to what they need to practice.
- In July, I started teaching our summer course in mathematics along with another colleague. Y-vei students were invited to start at the same time as tresemester students. Y-vei students normally start at the same time as the ordinary students.
 - It became very clear that Y-vei students have a very low level of mathematics before they start their engineering degree.
 - I discovered that students had found and were using an ápp' which enable them to obtain detailed solutions by taking a picture of the mathematics problem.
 - I started making original open- ended tasks and questions which had no fixed answers but which tested understanding. This is also inspired through my involvement with MaTRiC (I have volunteered to be one of UiT's contacts.)
 - This also hindered students copying from each other and 'borrowing' answers from the previous years' students.
- All sessions were set up in Canvas
 - Narvik students had their own sessions (øvingstimer) . If I made an exercise set too easy, then the students went off to work in the library instead of the cantina.
 - However, if the questions were more challenging, the need to ask classmates and the student assistants present, was greater and they stayed around more.
 - Students often find it more difficult to translate a problem formulated in words, to an equivalent mathematical expression.

- Proof that a student had worked on these alternative tasks had to be shown to a student assistant in order to gain approval (godkjent øvingstime).
- Stricter demands on students
 - Students wanting to take the exam to improve their grades were informed that they needed to repeat all assignments and obligatory work.
- Tests
 - We have planned 3 tests and a mock exam. The mock exam is the student's last chance to qualify to take the exam if he or she has failed to hand in an assignment or not attended an øvingstime.
 - We have also said it is an opportunity to practice examination conditions - make all the usual 'mistakes' (like copying errors, misreading questions) on the mock exam
- The internet students
 - Have to hand in work nearly every week although they have a 2-week window in which to complete the same tasks as campus Narvik students.

I used a lot more time on this project as I did not have a teaching assistant. I had hoped to engage a PhD student as a research assistant but was not able to find anyone with the right background who had the capacity to contribute to this project.

Non-pensum books have been purchased to help develop students' problem solving abilities- not just in mathematics, and not least to be able to do this online for the sake of the internet students.

Objective 3: Increased degree of inter-student collaboration and recruitment to master studies

For the autumn term 2019 I engaged 2 of the previous year's student assistants. They have much more experience and have developed tactics to get around 'tricks' employed by some, to do the least possible. I engaged another student assistant assist with digital versions of tasks. Two of the student assistants (engaged in 2018-19 academic year) have found jobs in Engineering another I now engaged at the President of Norway's International Student Union.

It was an important criteria that we had student assistants who were very enthusiastic and very good at communication, not just competent academically. Fortnightly meetings with them have also benefited the project greatly.

The student assistants have also been active in the social events we have organised. Through their ability to help students with their other course subjects, they have also helped to market their own masters courses.

At Campus Narvik, we cannot offer all possible types of engineering degree but we do our best to market the degrees we can offer.

Instead of a 2 hour session cramming in 15 minute presentations of each bachelor study course for forkurs students, we have organised separate laboratory tours for the different engineering courses. This enabled them to meet other students and teachers they would have if they stayed on. Away from an auditorium session, the opportunity to ask questions was much better.

Objective 4: Reduce student drop-out

Students' attendance has been monitored:

Although attendance of lectures was voluntary, this was registered (spot checked) by scanning the student cards/ student app on their phones

The øvingstimer were obligatory & were strictly monitored by the student assistants. Warnings were sent out to Campus students if they missed a week.

Nettstudenter also had to submit on a weekly basis which meant that they also received feedback from a student assistant weekly. A lecturer would not have time to dedicate this degree of attention to so many online students, nor reply to the countless emails.

The importance of socializing for students

After many one-to-one conversations with students, I have found out that a large proportion are struggling – they are lonely, lacking motivation, struggling with language, struggling making friends, have no one to work with. Foreign students especially, feel quite isolated.

Two students that I know of, have tried to commit suicide this year. I can imagine that there are others that I am unaware of. From experience this year, I am unsure that 1 student advisor for so many students is enough. I have used a lot of my own personal time and time at work and sought help from other sources to help students who struggle with psychological issues. From a conference I attended this autumn, I learned that up to 1 in 3 students can experience loneliness when they start their studies at university.

Because of these incidents, and extensive interviews with other students, I started a collaboration with the International Students Union (ISU) who have many of the masters students. One such event was Filmkveld with pizza

Leksehjelp/ Filmkveld med pizza- Narvik

In addition to an obligatory øvingstime, students also have the opportunity of attending voluntary 'leksehjelp' sessions. These are 2 hour sessions held three times a week, usually in the evenings. These are less formal than the obligatory sessions and we have held them in the more relaxed atmosphere of the cantina. We also had no choice of location because of the extensive reconstruction at the Narvik Campus.

Before a stressful examination period, we were able to offer the students free pizza and film after one of these 'leksehjelp' sessions.

This event went beyond all expectation. A good mixture of around 90 students attended this event. International master students, Bachelor students (ordinary, Y-vei, Forkurs; tresesemester)

We are planning further collaboration with ISU in a Cultural Event where students will be able to make a presentation of their country.

We hope to hold the Cultural Event in January 2020 to coincide with the 'return of the sun' to Narvik. We also hope to be involved in the International Food Event whereby foreign students make national dishes which are served free of charge to students and staff at Campus Narvik.

Mo i Rana

2 events: Pizza lunch earlier this year and Christmas event combining first, second and third year bachelor students. The first event included Forkurs and Y-vei students. As the Forkurs program in Mo i Rana was terminated in May, there will be no Forkurs students at the Christmas event.

Alta & Bodø

Forkurs students will invite the bachelor students (1. 2. & 3rd yr) for a pizza gathering before Christmas exams/ tests. This will give a good informal opportunity for forkurs students to find out more about the Bachelor programs from the students themselves instead of brochures or staff.

Narvik

Because of the drop-out rate of students and depleting motivation among students taking Forkurs in Narvik, we are planning a couple of other social events just for Forkurs (event with pizza & Kahoot – get to know each other better)

Tournaments with Trophies and medals

We managed to socialize some of the student groups by organizing tournaments between teachers/ student assistants, 2 forkurs classes, tresesemester, Y-vei, the Norwegian language (foreign) students (spring event): and sometimes the nurses.

Trophies will be engraved with LMU / IVT Champions for sports and non-sports competitions

The idea is to have trophies on display in Glassgata when the refurbishment work at Campus Narvik is finished. The trophies will have a removable plate on which the winners from year to year can be engraved.

Students (campus Narvik) & staff can aspire to be awarded these trophies as a team or a class. They receive a medal but the trophy stays in the cupboard but with a new name engraved from year to year.

Volleyball, Fotball, Innebandy, Bordtennis, Best show at Cultural Event, Best Class

Objective 5: Recruitment to bachelor engineering

I attended a Conference in Trondheim organised by the Senter for realfagsrekruttering (Nordic conference for STEM recruitment).

Ideas from this conference/ meeting will aid recruitment forkurs i realfag students to our own bachelor engineering degrees. (Forkurs mathematics provides them with an equivalent R2 maths qualification which they can use for admission to medicine, dentistry etc).

Participants from institutions in Norway, Denmark, Finland, UK and USA were able to share experiences and practice with each other.

The Examination Results & student feedback

The examination results for the bachelor students were not especially better than previous years. There were other more academical factors that played a part.

However, on a positive note, compared with previous years, students were now aware of which other students were studying the same program. By grouping them together on a weekly basis, we opened up their possibilities for collaboration on other program subjects and not least, facilitated possibilities for finding partners for their Bachelor projects in their final year. We observed that students gathered in smaller groups outside of these obligatory sessions – in the kantina, smaller grupperom and the library. It has been most important that each new student would get the impression that they were 'seen' and that someone cared about how they were doing.

As mentioned earlier, students were reluctant to have imposed on them an 'extra' session a week. After feedback on the first sessions, we adapted activities and groupings according to the students' abilities. We had to avoid groupings where one person would do all the work while the less able looked on helplessly. Feedback enable us to develop activities which most important of all, gave them a sense of 'mastery' (mestringsfølelse). The job of the student assistant was to ensure that students could get the right amount of assistance in solving problems.

It was extremely difficult to find activities that covered the entire range of abilities – from the very weakest of students to the most capable.

This autumn, we have had complaints that we do not make exercises that look like the traditional exercises made by the course lecturer.

Through some research, I have developed exercises of a nature that encourages students to collaborate with each other and that makes them think differently about conventional problems.

National Achievement – Forkurs

On a national basis, Narvik forkurs' examination (national exam for all forkurs for engineers) results were the best in Norway (0 % failure in mathematics (national average 29% , 3 % failure in physics (national average 25 %)) This degree of success is due to factors practiced by Forkurs Narvik. Alta Bodø including obligatory attendance, mappeevaluering, and obligatory tests which candidates have to pass in order to take the final exam.

In order to improve examination results for Bachelor Engineering students we implemented these obligatory sessions and from this year, have removed a 'cheat sheet' as an examination aid.

After some time, we have realised that students have misused this aid, hoping to copy from this A4 sheet instead of learning and understanding the subject. Some students were copying sheets made by others, some photocopied earlier exams and solutions and pasted them in.

They are not very happy about this and have reluctantly understood this after we have explained why we have done this. This year's students blame the previous years' students for abusing the system. Some expect an 'easier' exam to compensate for the 'loss' of this 'hjelpesark'.

Regnskap og Budsjett

Regnskapsoversikt per 05.12.18 (for periode jan.-des. 2018)	
740138 - Økt gjennomstrømming i fellesfag (LMU-midler)	
Inntekter	
Tildeling fra Læringsmiljøutvalget	-200 000,00
<u>Sum Inntekter</u>	-200 000,00
Kostnader	
<i>Lønnskostnader</i>	
Timelærer (lønn til stud.ass - Raymond Wang, Guillermo Sifontes, Alexander Berntsen, Amine Fquihi, Eeke M. Nijdam)	15 072,83
Pålopte feriepengar	1 808,53
Arbeidsgiveravgift av innberettet lønn, honorarer	773,31
Arbeidsgiveravgift av pålopte feriepengar	92,25
Arbeidsgiveravgift av påløpt pensjonsinnskudd	31,97
Arbeidsgivers Pensjonsinnskudd SPK	626,80
<i>Driftskostnader</i>	
2 stk. strekkodelesere for reg.av oppmøte Mat.1	1 198,00
<i>Reisekostnader</i>	
Reise Arlene Hall	3 843,00
<u>Sum Kostnader</u>	23 446,69
<u>Saldo per 05.12.18 (resterende beløp - penger å bruke)</u>	-176 553,31

Saldo overført fra 2018	-173 059,83
Kostnader	
Lønnsutgifter inkl. sosiale utgifter til timelønnede stud.ass (Alexander Berntsen, Eeke Nijdam, Raymond Wang, Amine Fquihi, Guillermo Sifontes, Sigve Landsem)	96 218,60
<i>Tilsl.</i>	
Lønn Alexander Berntsen (Januar-Juli 2019) Ikke levert timeliste for sept og okt	18 179,06
Lønn Sigve Landsem (September-Oktober 2019)	10 216,15
Lønn Eeke Nijdam (Januar-september 2019)	37 699,02
Lønn Raymond Wang (Januar-Juni 2019) Er ikke lenger stud.ass v/LMU	13 866,84
Lønn Amine Fquihi (Januar-Juni 2019) Er ikke lenger stud.ass v/LMU	13 306,05
Lønn Guillermo Sifontes, ikke lenger stud.ass v/LMU	2 951,48
Andre driftskostnader	
Pizzalunsj for studenter ved Mo i Rana 29.03.19, 25 stk	2 892,80
ref. Elisabeth Kulseng-Johansen, utlegg til kjøp av brus for sosial sammenkomst til studenter ved Mo i Rana, 15 stk	289,40
1 kanne med kaffe ifbm avslutning studenter 26.07.19	145,00

<i>Sum kostnader(lønn + drift)</i>	99 545,80
Resterende saldo per 20.06.19 (midler å bruke)	-73 514,03
<i>Forslag til Budsjettplan for bruk av resterende midler</i>	
Lønnsforpliktelse til 3 stk. stud.ass (oktober, november, desember)	45 000,00
Reiseregning, bøker, felles arrangement til studenter i Mo, Bodø, Narvik, Alta (julearrangement)	18 514,03
Tilskudd til studentforening/organisasjoner	10 000,00
<i>Sum kostnader</i>	73 514,03

Supplement to the initial report (Part 2) available 31.01.20

This report will be supplemented to including the following, pending data which should be available before 31.01.20

- Student feedback from the third term for the project
- Evaluation of student assistants
- Comparison of examination results with term 1 of the project
- Final accounts – remaining activities to be completed before 31.12.19
- Conclusions based on feedback and autumn's examination results.
- The imprint left om the students by this project.