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Online Teaching and Learning

First impressions from **educators** as NTNU transitions to an online only mode of learning

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1 Introduction

After NTNU – and Norway in general – was locked down on March 12 because of the coronavirus crisis, all educators had to transition to online teaching in record speed. In the following week, the question of how this transition was impacting and affecting students and educators alike started to rise. Excited, the Center for Excellent IT Education at NTNU and NORD University, decided to run a study to shed some light on the question: "How are the students and educators experiencing the change from campus-based to online learning?" To shed some light on these questions two surveys were developed; one for educators and one for students. This report gives a first aggregation of the results of the educator survey. A parallel report documents the results from the student survey (Lorås 2020).

The Centre for Experiential Legal Learning (CELL) at the University of Oslo has done a similar study in parallel (Langford et al. 2020). The Excited study is very much in line with the results in the CELL study, but there are also some differences, as will be described in this report.

2 Methods

Both surveys in the Excited study were designed with the aim of getting a first impression of the new situation, an impression that could form the basis for identifying issues for increased attention by educators and leaders and for identifying potential needs for further study. The surveys were kept as short and precise as possible to avoid discouraging students and staff from participating in the study. The surveys included both quantitative and qualitative elements. The qualitative questions were mostly written in an open form, allowing the respondents to describe their experiences in their own terms.

The two surveys were distributed on Monday March 23rd, after one full week of online teaching and learning had been completed. For deployment of the educator survey the authors and the NTNU Drive collaborators used their own departments as the starting point. Later the survey was also distributed through the authors' faculty's intranet. The data reported on in this report is based on the responses that came in before Monday March 31th.

3 Survey Results

56 NTNU educators responded to the survey. 12 educators from Gjøvik responded, 38 from Trondheim and six from Ålesund. Most of the educators were affiliated with the IE faculty, but there were also responses from educators affiliated with four other faculties. The small number of respondents does to allow for much generalisation of the results. We will therefore not put much weight on the quantitative results in this report but rather focus on the qualitative results.

The survey was conducted in Norwegian as well as in English. The current version of the report will include quotes in the original language, which means that the quotes will appear in a mix of Norwegian and English.

3.1 Previous Experience and Online Teaching Competency

Approximately one half of the educators had previous experience in online teaching – varying from about 40% to about 60% between the NTNU cities. These are higher numbers than the 30% that were reported by Langford et al. (2020).

Approximately half of the educators also reporting that they have the required competence to teach online. Nearly one third of the educators report that they do not have the required competence. Most of the remaining educators report that they possess the technical competence only while a smaller number report that they possess the pedagogical competence only.

3.2 Educator Experiences from the Transitional Phase

In the survey, the educators were asked whether the transition to online teaching had been a positive experience. Nearly four out of five educators report that it had been a positive experience. There was no big difference between educators with previous online teaching experience versus educators without.

3.2.1 Positive Aspect

The educators were also asked what the most positive aspect in transitioning to online teaching was. Several educators mentioned – sometimes in a tone of surprise – that the tools and the technology mostly did work as intended and that the quality and accessibility mostly were good, despite heavy use.

Several educators also mentioned that the transition to online teaching itself had been positive. Some educators even mention that this was a transition they had been planning to do themselves or a transition they were looking forward to seeing their colleagues go through. Several educators mention staff and student showing a positive and constructive attitude towards the change as being a success.

Some of the positive aspects of transitioning to online teaching were related to students. Several educators mentioned that new possibilities for interacting with students were among the positive aspects. Some educators mention experiencing more dialogue with the students, more questions from students, and generally more interaction than in the traditional way of teaching. Some educators also mention that improved student flexibility is one of the positive aspects of transitioning to online teaching – that the educators have been able to transition to a form of teaching that better suits the students' study and work conditions. It was also mentioned as a positive aspect that efforts spent on the transition to online teaching potentially would benefit future students too.

Collaboration and sharing were also mentioned by several educators as positive aspects of the transition to online teaching. Other positive aspects include positive changes to the educator's own working conditions – especially related to increased location independence and reduced travelling.

Sample Quotes 1: Positive Experiences

Digital solution worked – even better than expected:

- *At de fleste verktøy fungerer som de skal, selv om belastningen tidvis har vært stor.*
- *Teknlogien ser ut til å fungere OK i forhold til 1) intensjon, 2) kvalitet i overføring og 3) tilgjengelighet.*
- *The fact that we got it to work at all.*

Change experience:

- *Jeg ble tvunget til å gjøre noe jeg hadde tenkt på lenge.*
- *That all the people that was saying "this is too difficult for me to do it" now has to do it.*
- *The smooth transition where all staff and students adapted to the new situation.*
- *Den svært konstruktive innstillinga ansatte har hatt til å endre undervisningsformer. At folk har tatt så sterkt ansvar for å gjøre det beste ut av situasjonen.*
- *Positive and motivated students.*
- *Lært å bruke nye digitale verktøy.*

Student interaction:

- *Det er lett for studentane å stille spørsmål, og det er lett å få alle til å delta i f.eks quizzar.*
- *The most positive aspect is that I get closer to the students through chat.*
- *Forelesning for store grupper med Collaborate gjør at foreleser får bedre dialog med studentene under forelesningen. Under nettbaserte kan du spørre om det de lurer på underveis, og det kommer inn mange flere spørsmål enn under en vanlig forelesning.*

Improved student flexibility:

- *Sessions are recorded, then the lectures are available at any time if the students couldn't join at the normal time.*
- *Vi har klart å finne fram til arbeidsformer som kan tilpasses studentenes livs- og arbeidssitiuasjon.*
- *The ability to make something that lasts beyond this semester – something that students next year will also benefit from.*

Sharing of experiences:

- *Samarbeidet med andre kollegaer via nett*
- *Colleagues are helpful.*
- *Vilje til å dele og prøve ut nye digitale læringsressurser.*
- *NTNU har raskt vært ute med opplæring i form av webinarer, video og beskrivelser.*

… and some other types of positive experiences:

- *Fleksibilitet i arbeidssted, det å ikke være bundet til sted ved undervisning og veiledning.*
- *Slipper kjøring 45-60min hver dag.*
- *Flexibility of scheduling meetings – no need for finding rooms.*

3.2.2 Challenges

As mentioned above, some educators report on improved student interaction after transitioning to online teaching. The most reported challenge in transitioning to online teaching, however, was related to reduced contact with students and reduced student interaction. The reduction of student contact and interaction was often mentioned in relation to online lectures or meetings as replacement for physical ones and the lack of eye contact and non-verbal feedback in such cases. There were, however, also several educators who mentioned experience students being less interactive and less willing to provide feedback. Some also mentioned loss of teacher engagement.

Technical challenges were also highlighted by several educators. The educators are experiencing challenges related to their home office and to the network in general but also challenges related to the technology at the student side specifically. There are also challenges related to the tools being used, to the user experience in general and to the stability of the tools.

Another main challenge for the educators is lack of experience and competence in online teaching. Educators found it challenging to find and choose among candidate technologies and systems that would work well for both staff and students. Educators also found it challenging to design teaching and learning activities that could successfully replace the traditional ones.

It is well known that time is a major change barrier for educators (Brownell et al. 2017). Time was a challenge mentioned by several educators also in this study. Educators mentioned the time required to learn and set up tools, the time to modify the plan and design new learning activities, the time required to produce online learning material and to lead online learning activities, the time spent on giving student special attention and assistance in these times of change, time to assist colleagues, and the time required for everyone to adapt to new and unfamiliar routines and ways of interacting.

Educators also mentioned several other challenges, such as being lonely, facing curriculum challenges, being tired from working in front of the computer screen all day, and GDPR and privacy concerns.

Several educators mentioned multiple concerns. Only two educators had explicitly stated that they did not face any challenges in transition to online teaching.

Sample Quotes 2: Challenges

Lack of student contact and interaction:

- *I feel, online teaching as very static in the sense that I do not have contact to my audience, no eye contact, no visible body language which may express mutual understanding of the subject to be taught.*
- *Overall, students are less interactive. I believe the unfamiliarity with the medium, the "silence" (microphones are muted by default), and the lack of a shared visual environment introduces a threshold for sharing thoughts freely.*
- *Live student participation has dropped, and most students rely on passive content posted in a form of video recordings.*
- *Working out how to get good feedback from students*
- *Obviously, a physical class is more engaging for the teacher at least. You don't see the students and so you can't get a feeling on how things are going.*

Technical challenges:

- *Lage seg et oppsett hjemme som gir godt arbeidsmiljø.*
- *Nettilgang som har gitt begrensninger - faller ut fra nett, tunge datafiler tar lang tid å laste opp.*
- *Etter å ha fungert utmerket fram til i morges, kollapset Blackboard Collaborate Ultra o vi måtte finne en alternativ løsning.*
- *Some of the students do not have good internet connections, making it problematic to share video/screen. And some students are shy to share video/screen. Some of the technical solutions have not worked on all platforms.*
- *Dårlige verktøy.*
- *Flere [studenter] klager på dårlige brukergrensesnitt i noen av programvaren som NTNU tar i bruk (for eksempel Blackboard Collaborate Ultra)*

Lack of experience and competence:

- *Manglande opplæring på førehand.*
- *Figuring out which technical solution works best.*
- *Å prøve ut og få en oversikt over tjenestene, velge noe som både fungerer bra for studenter og fagstab.*
- *Working out how to get good feedback from students.*
- *Få til gode opplegg der studentene skal jobbe i grupper.*

Time and efforts:

- *Få tid til å lære seg verktøyet.*
- *Time! It's been a huge amount of extra work to prepare online teaching.*
- *At det er utrolig tidkrevende. Jeg må gjøre en del om på undervisningen jeg hadde planlagt å holde. Jeg bruker mye tid på å digitalisere undervisningen og få lagt den ut til alle studentene mine som (som spenner seg over 5 ulike emner), og det tar tid å følge opp studentene i deres ulike klasserom. …. Så det krever mye arbeid og tid å digitalisere egen undervisning, samt følge opp studentene (som jo trenger litt ekstra oppfølging av oss i denne situasjonen).*
- *Teach my colleagues how to do it.*
- *Rearranging and replanning already planned activities*
- *Møter er ikke effektive - hver gang 5-10min går til løsning av teksniske problemer, hilsener, osv.*

Other types of challenges:

- *Det er dessuten svært slitsomt å sitte på skjerm hele dagen.*
- *GDPR and privacy limitations/constraints make the student-generated content hard to record/share with those that rely on passive content*

3.3 Tools Used

In their study of how the academics in Norway experienced online teaching in the time of the coronavirus, Langford et al. (2020) list many tools being used by educators to produce learning material and to interact with the students. The NTNU educators also mention many tools; 28 different tools for interacting with students and 14 additional tools for producing learning material are mentioned. This includes tools for offering online lectures and seminars, tools for video streaming, chat rooms and question-answering systems, student response and student survey systems, document sharing tools, and planning tools.

Sample Tools List

Tools for online lectures and seminars:

- *Blackboard Collaborate,*
- *Discord, Microsoft Teams,*
- *Skype/Skype for Business,*
- *Zoom*

Tools for video streaming:

- *Mediasite,*
- *Omnom (developed and used at NTNU Gjøvik only),*
- *Youtube*

Chat rooms and Q&A systems:

- *Blackboard,*
- *Discord,*
- *Flinga,*
- *FlipGrid,*
- *Microsoft Teams,*
- *Padlet,*
- *Piazza*

Student response and student survey systems:

- *Kahoot,*
- *Microsoft Forms,*
- *Mentimeter*

Document sharing:

- *Blackboard,*
- *Elink.io,*
- *GitLab,*
- *Google tools,*
- *iLike,*
- *Office 365,*
- *Overleaf,*
- *Python notebook*

Planning tools:

- *Doodle,*
- *GitLab*

The Langford et al. (2020) study shows that Zoom is the most preferred tool, reported being used by almost 80% of the respondents. The feedback from the NTNU educators indicates the NTNU situation is more mixed. Blackboard Collaborate Ultra is the most used tool, reported being used by more than 40% of the respondents. There are also more educators reporting the use of Microsoft Teams than Zoom.

3.3.1 Synchronous vs. Asynchronous Tools

Being asked about whether they prefer synchronous or asynchronous tools when teaching online, the educators are split. 40% indicate that they prefer synchronous tools, 40% indicate that they prefer asynchronous tools, while 20% prefers a mix of the two.

The main reason, mentioned by the educators, for preferring synchronous tools when teaching online, is student interaction. These educators emphasise the opportunity for live communication with the students. Some educators also mention reasons such as minimal post-production work, lecturer engagement, and because it resembles classroom teaching.

Sample Quotes 3: Reasons for Preferring Synchronous Tools

Being able to interact with the students:

- *This gives me an opportunity to live communication, questions and feedback from the students.*

Other reasons:

- *Det medfører minst etterarbeid.*
- *It is engaging for the presenter.*
- *Vet ikke helt, kanskje fordi det minner om "klasserommet".*

Student flexibility and control was the reason mentioned by most educators for preferring asynchronous tools. Some educators also mentioned that live interaction with a large group of students may be even harder online than in a classroom and that asynchronous tools may provide better ways for interacting with large classes. Other reasons mentioned for choosing asynchronous tools include the risk of experiencing technical problems, student preferences, possibilities for reuse, and their own competences in online teaching.

Sample Quotes 4: Reasons for Preferring Asynchronous Tools

Being able to interact with the students:

- *Async (such as e.g. screencast videos) has several advantages: (i) need not fit into the typical 2 x 45 time box, can be adapted to whatever length fits the topic at hand. Better to make many shorter videos, instead of one long session. (ii) students can use the material at a time that suits them, and also vary the pace according to own needs ...*
- *Når man har allerede dårlig kontakt med studenter i et fysisk klasserom, er det enda verre på nettet. Fungerer helt fint for møter, men ikke formidling av stoffet.*
- *Asynkron undervisning åpner for god dialog også for store grupper (over 100 studenter).*

Other reasons:

- *I haven't tried synchronous in large courses yet, but I think it's easier for the teacher to not run into technical difficulties and loose a lot of time.*
- *Studentene har gitt tilbakemelding på at de foretrekker dette.*
- *If one manages to make good videos, they can be reused in subsequent years.*
- *Jeg er heller ikke trenet i å holde synkron undervisning på nett, derfor foretrekker jeg å legge ut undervisningsbolker som studentene selv kan velge når de vil gå inn å se på/lytte til/arbeide med.*

3.4 Resources used by educators to prepare

The Langford et al. (2020) study asked the respondents what had helped the educators in transitioning to online teaching. The study shows that most popular answer was self-help, but many educators also consulted colleagues or more experienced users. The Excited study shows similar results where 40% of the educators use their own ideas and/or made use of Internet resources while 60% of the educators have consulted more experienced users and/or worked jointly with a colleague when transitioning to online teaching. Most users made use of several different types of resources, the most reported resource being using their own ideas (75%).

3.5 Impact on Teaching Methods

The Langford et al. (2020) study reports that most of the Norwegian educators did make changes to their teaching methods when transitioning to online teaching. The Excited study shows similar results, as described in the following subsection. This study also investigated what specific changes the NTNU educators made to create and facilitate an environment that promotes the social aspects of learning. These changes will be described in a later subsection.

3.5.1 General Changes

Nearly one half of the educators report offering online lectures. Some of these educators mention using additional tools, such as chat rooms, online meetings, and student response systems, to allow for more interactive sessions. A small number of the educators mention using break-out rooms during these lectures to allow for student discussions in smaller groups. A small number of the educators also report having made changes to their lectures to make it them for online delivery.

Some of the educators provided screencasts or recorded lectures in place of online lectures. Half of them report on adding chat rooms and/or online meetings for additional student interaction. Some of the educators reported on reusing recordings produced before, while most of them produced new recordings – full-length lecture recordings or broken into smaller topic-based recordings.

Many of the educators report on using online meetings for supervision and for assisting students working on lab work or exercises. Some of the educators report on having to drop lab activities that required resources that were no longer available.

Sample Quotes 5: General Changes to Teaching Methods

Offering online lectures:

- *Byttet forelesninger til Blackboard collaborate.*
- *Komprimert undervisningsøkter for å opprettholde konsentrasjon både hos underviser og studentene.*
- *Jeg har ikke gjort veldig store endringer: Jeg har fremdeles en bolk med "forelesning" der jeg bruker PP og svarer på spørsmål underveis. […] Det nye elementet for meg og studentene er chatt hvor studentene praktiserer temaet skriftlig.*
- *Lagt tilrette for samarbeidslæring og diskusjoner med bruk av gruppeinndeling (Breakout-rooms) i Blackboard Collaborate.*

Providing screencasts or recorded lectures:

- *Vi bruker video fra forelesninger i fjor.*
- *Recorded video lectures plus follow-up online meeting instead of ordinary lectures.*
- *Hver forelesning er kortere på video, og vi samles bare tre kvarter med Collaborate for å gå gjennom og spørsmål.*
- *Material has been moved to modules which the students can do in their own time. We have a discussion board on Blackboard for questions and problems, and have set time when we guarantee someone will be watching it.*

Changes to lab work or exercises:

- *Lab sessions with TAs through chat + one-to-one video calls.*
- *Initially, hands on exercises in the lab are required where the students are required to conduct physical colour measurements using different measurement instruments and reproduction devices. Due to online mode of teaching these activities can not be conducted any longer.*

3.5.2 Creating and Facilitating Environments to Promote Social Aspects of Learning

Approximately one third of the educators are not reporting on any special efforts to create an environment to promote social aspects learning environment, although some of them encourages students to create such environments themselves. Approximately one half of the educators reports on creating online forums or online meetings specifically for enabling a social learning environment. Approximately one fifth of the educators are reporting on assigning students' group work for promoting social learning activities among the students.

Sample Quotes 6: Creating and Facilitating an Environment that Promotes the Social Aspects

No special efforts:

- *Har opprettet et eget Collaborate "rom" for studentene som er åpent døgnet rundt, der alle får rollen som moderatorer. Dermed kan de selv opprette samarbeidsgrupper osv, og styre bruken selv. Vet ikke om det kommer til å bli brukt, men tilbudet er der.*
- *Jeg gjør ikke det. Bruker Collaborate og kun det. Orker ikke mer.*

Creating online forums or online meetings:

- *Jeg gir studentene oppgaver de bør løse i par. Jeg snakker med dem online i Teams eller via Skype, jeg oppretter padlet eller diskusjonstråder i Bb hvor de kan samarbeide og/eller lese hverandres forslag til løsninger på oppgaver, oppfordrer til digitale kollokviegrupper, tillater at de sender inn korte videoer hvor de samarbeider online om oppgaver som svar på oppgaver.*
- *I introduced some tasks after each block and created threads in a dedicated blackboard forum in case for questions. For the final task I asked the students to post ideas and comment on each others posts.*

Assigning group work:

- *Have refocused exercises more as group work.*

4 Main Observations

This study does not due to the limited number of respondents. Still, the study does draw a picture of diverse response among educators to the abrupt transitioning to an all-online form of teaching due to the coronavirus lockdown. Knowing this variety in responses may help educators in sharing experiences and best practice and may help leaders identify needs for coordinating actions within the departments. This study may also help the research community in defining further studies that may prove beneficial to students, educators, and university leaders.

4.1 Sharing Experiences and Best Practice

The study shows that educators have different and sometimes opposing experiences. Where some educators report on increased student interaction as a positive aspect of the transition to online teaching, other educators report on loss of student interaction being one of the big challenges. Where many of the educators report on having transitioned to online teaching without collaboration or assistance by any of their colleagues, other educators report on the sharing of experiences with colleagues as a positive aspect of the transition. Where some educators are actively assigning group work and other types for student-collaborative tasks, other educators report on difficulties in getting students to participate in the online activities.

These differences in experiences from online teaching may suggest that many educators could benefit from sharing experiences with other educators.

4.2 Identifying needs for Coordinating Actions

The study confirms earlier studies that time, educator competence and technology are barriers for not only online teaching but also for blended learning and for student-active learning. Addressing these barriers will require resources and leadership involvement. The previous subsection suggested that best practice sharing among educators may be beneficial for educators and students alike. Such experience sharing would benefit from support from the leaders.

Previous research has shown that the educators' lack of interest in – and resistance to – online teaching is another barrier (Kebritchi et al. 2017). In this educator study, several educators express

positive attitudes towards the online experience and to the change experience. The positive experiences and attitudes may indicate that educators may no longer oppose the idea of online teaching but may rather be willing to transition further into online and blended learning. This, however, is more likely to succeed if supported by the leadership.

The study also shows that many tools are being used by the educators for online teaching. This diversity of tools may be a healthy sign indicating that educators have a large selection of tools to choose among for choosing the best on for the actual context. Some of the educator responses in this study, however, suggest that the choices may have been incidental rather than deliberate in many cases resulting in suboptimal solutions and increased burden on the students. Better coordination may reduce these deficiencies.

4.3 Defining Further Studies

This study indicates that there may be opportunities for developing and documenting improved practices for online and blended teaching and learning. This study also indicates that there may be new opportunities for online and blended learning because more educators now have experiences, and positive ones, from online teaching and that educators may have more positive experiences in sharing new teaching experiences. These may be topics for future studies.

5 Conclusion and Future Work

As mentioned above, this study draws a preliminary picture of the diverse responses among educators to the abrupt transitioning to an all-online form of teaching.

This report presents an aggregation of the results from the educator survey. As mentioned in the introduction, a separate student survey was conducted in parallel (Lorås 2020). An investigation that combines the results from the two surveys remain to be done. In-depth interviews of selected students and educators with the aim of studying the variety of practices in more detail also remain to be done.

6 References

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