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A survey of experiences with distance and online teaching in DTU Mechanical Engineering courses

Empirical data - sources



- Questionnaires to collect experiences with online teaching
 - DTU Mechanical Engineering questionnaire (teachers' perspective):
 - DTU Inside questionnaire as part of the exam evaluation (students' perspective)
- Questions in DTU Mechanical Engineering questionnaire:
 - What worked well?
 - What worked less well?
- Questions in DTU Inside questionnaire:
 - What worked well? Please tell us about any positive aspects of on-line teaching that you think DTU can use in the future.
 - What did not work well? Please tell us about aspects of on-line teaching that could be improved.



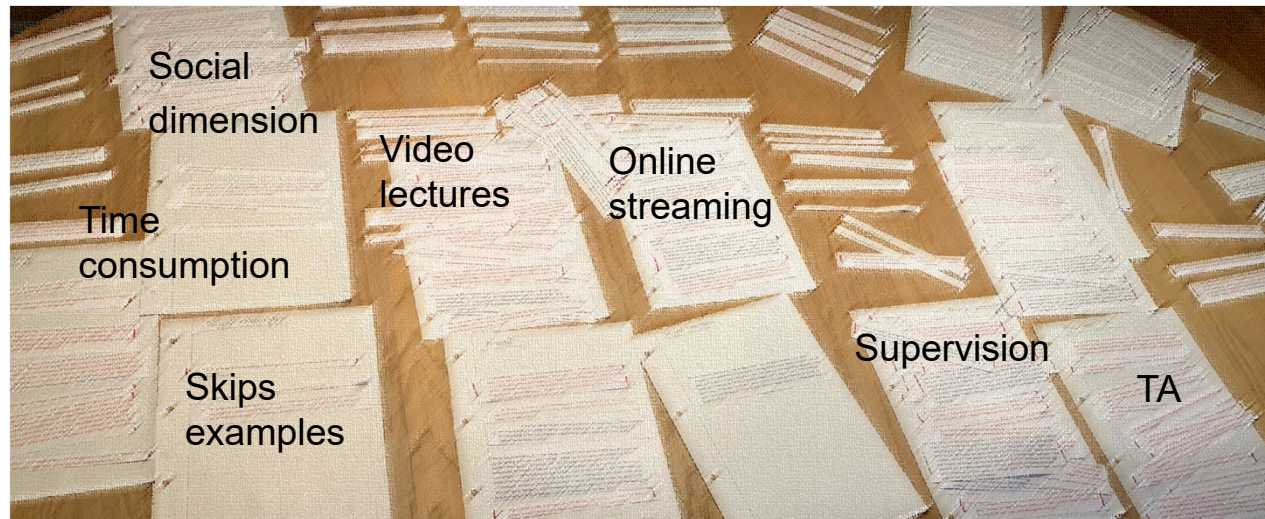
Empirical data - 251 statements

- Questions in DTU Mechanical Engineering questionnaire (**teachers' perspective**):
 - What worked well?
Number of statements: 39
 - What worked less well?
Number of statements: 49
- Questions in DTU Inside questionnaire (**students' perspective**):
 - What worked well? Please tell us ...
Number of statements: 91
 - What did not work well? Please tell us ...
Number of statements: 72

KJ-method to analyse data

- “The purpose of the KJ-method is to establish a hypothesis about the relations between large amounts of data in a bottom-up process. When using the method for analysing information about complex problems, the structuring effort will most likely bring along ideas for solutions.” [Buur]

Making the affinity diagram:



Identified themes

- Online lectures
- Video lectures
- Group work and supervision
- E-mail supervision
- TA
- Videos explaining answers to previous exams
- Time consumption/Time management
- The social dimension
- No transportation
- Lack of physical materials/models
- Technical issues
- Thought provoking statements

Observations: *Software tools*

- Many different software tools have been used:
 - Online lectures: Zoom, Skype, Teams
 - Pre-recorded lectures: pdf-files with voice over, YouTube videos, Adobe Connect
 - Lectures without voice/self study: PowerPoint slides
 - Supervision: e-mail, Piazza.com, Discord, Mural

“It was annoying that two different platforms were used for this.”

“I believe it would benefit the students a great deal if they had the option to look at the streams of the lecture at a later date e.g. exam preparation. Also an absolute MUST is for the teachers to use a unified streaming platform. We have been using 3 different ones during the semester and that is not good. Zoom seems nice, but discord/microsoft Teams is also nice for group work.”

Observations: *Online lectures*

- Difficult to sense the students' reaction

"Det var svært at se reaktionerne på de studerende, så det er lidt svært at bedømme om der er en god respons fra de studerende. Der er ingen feedback under selve forelæsningen."

"svært at fornemme om de studerende modtog undervisningen som tiltænkt - ved spørgsmål var det typisk samme studerende der svarede."

- but helps students' motivation

"At afholde LIVE forelæsninger online har virkelig været godt! Det holder en motiveret til at få lavet det man skal og følge med i faget på uge basis, så man ikke falder bagud/udskyder det."

"Fungerede rigtig godt med skype-undervisning især fordi der kunne komme en kommunikation imellem forelæser og studerende. "Tvang" også lidt en til at følge den normale skema rytme, fordi det ikke blev"

"det virkede godt, at læreren var meget opmærksom på om dem der fulgte med havde forstået materialet rigtigt.. både med at stoppe op og spørge ind til om man er med, men også stille faglige spørgsmål til de studerende"

"The drawback is you cannot ask direct questions during the course. You still have the opportunity to ask questions, but it cannot be compared to the lecture being conducted in person"

Observations: *Video lectures (1)*

- Students can replay the difficult parts

”Der var positiv tilbagemeldinger om de digitale forelæsninger. De var glad for at have muligheden for at bruge dem i deres egen fart.”

”Lyd annotationer til undervisningslides var gode, da de kunne genhøres.”

*Lyd-annoterede forelæsningslides.
(Hovedparten af feedback fra de studerende på disse har været meget positiv)*

”Jeg var ikke god til at følge med når undervisningen fungerer som den gjorde, med powerpoints med speak. Jeg fandt det svært at engagere mig i denne undervisningsform. Jeg lavede derfor istedet samtlige tidligere eksamenssæt.”

- Students may choose their individual time schedule

“What worked the best was not having to wake up super early and saving money not having to drive two hours a day...”

”Umiddelbart fremstår den eneste fordel, at man selv har kunne tilpasse undervisningen til en egen skemalægning.”

Observations: *Video lectures (2)*

- but students cannot ask questions and may find it difficult to engage in teaching

"Videoerne ikke muligt at stille spørgsmål under forelæsningen."

"Honestly, i thought that the online teaching was way too easy. - Just following a video step by step reminds me of being a little kid trying to learn different softwares by watching youtube videos."

"Det har været virkelig godt med videoerne - særligt når man har kunne spole tilbage og høre noget en ekstra gang hvis man ikke fik en detalje med. Jeg vil altid foretrække at få fysisk undervisning, men hvis jeg skal være ærlig tror jeg næsten at jeg har fået et større udbytte ved at se videoerne frem for tavleundervisning (hvis der blev sagt præcis det samme). Ulempen er jo selvfølgelig at man ikke kan spørge ind til detaljer. Selvfølgelig kan man skrive en mail, men det virker bare besværligt og tungt."

Online undervisning er lidt som jolly cola. Det er en anden rang udgave af den rigtig cola. man kan perfektionere opskriften så meget man vil, men det "hemmlige ingrediens" er der fysisk fremmøde, kan man ikke efterligne og kvaliteten af undervisning vil være markant ringere!"

Observations: *E-mail supervision*

- E-mail an open invitation

"Mail-korrespondencen med de stud. Jeg har indtryk af at dem som skrev følte sig godt hjulpet, og jeg har været glad for den kilde til kontakt."

"...E-mail: De (fleste) studerende der gjorde brug af tilbudet tog sig tid til at formulere deres spørgsmål godt således at det var (relativt) nemt at give et godt svar."

- but...

"I missed having the TA being present for help after the lectures. It is much more difficult to describe your questions via E-mail and you also hesitate more to ask."

"Til gengæld er kursets form svært på online-format, fordi ofte bliver forståelsesproblemer til opgaverne bedst afklaret ved at tegne og diskuterer end at skrive over nettet."

"It was really hard to conduct the exercises, since the teachers would not answer to emails (we had to send the same email multiple times until we got a not really satisfying/ helpful answer)..."

- Maybe it is better to organize an online Q&A session

Observations: *Time consumption*

- Online teaching and learning is more time consuming than real life teaching

”Jeg synes ikke online undervisning kan erstatte rigtig undervisning. Jeg benytter mig meget af at stille spørgsmål, og lærer meget af det, men det var det ikke samme mulighed for online... Flere gange oplevede jeg at der blev misforstået hvad jeg skrev, og det ville være meget hurtigere klaret i virkeligheden.”

“The only negative aspect was that it increased around 30% the time to dedicate to the subject, it took on average 3.5 hours to "translate" in notes the lectures”

- The teachers are also challenged...

”Rettelse af rapporter online på DTU Learn er 2-3 gange langsommere end rettelse på papir.”

“I really liked the online course content on Youtube. All the small details you would miss in class, you had right in front of you. This said, the analysis of each lecture took a lot more time than normal. Personally I have spent 4-6 hours on each lecture, as you have a tendency to stop and play all the time. This is without the time spent on the exercises.

“... Also not to stereotype, but it might be that alot of engineering students are dyslexic, me for instance, reading is therefore highly time consuming task compared to lectures...”

”Forsinkelserne i forlæsningene, sammen med at forlæser helt tydeligt var på randen til sammenbrud med stress!”

Observations: *The social dimension*

- Dialog and knowledge sharing is important for learning

"Vidensdeling ved at se hvad de andre arbejder med er næsten fraværende når man sidder rund i hjemmene. Ligeledes kan de studerende ikke 'hænge resultater op på væggen' - hvilket ellers er en god måde at bevare overblik på og sikre kommunikation intern i gruppen og til andre grupper."

"[Lacking] the possibility of comparing results and learning from class mates."

"Der er en del udenlandske studerende på kurset. Det er tydeligt at de kunne have brug for vejledning, hvor man viser hvordan opgaverne skal løses"

"Måden faget normalt kørt på passede, godt at kører videre online. Da man havde en fast gruppe/makker og var også nogle at løse opgaven med. Det var også fedt at der stadigvæk var rig mulighed for vejledning."

"især det at jeg bor på samme køkken på kollegiet som min arbejdsmakker gør jo at forskellen bliver mindre end ellers"

"All the problem work and group work didn't follow though. I had a very hard time working on the course without any help or anyone to work with, since I didn't know anyone in the class. More group work and problem-solving would make the course much easier."

- Maybe it is the teacher's task to help all students in finding mates for group work

Opening for questions and discussion

- What are your experiences?
- What would you do differently if you were to do it again?

“Nothing to report, all worked well.”

“It felt like the teacher checked out, when the course had to be done online. We had one guest lecture and occasional q&A's. But there were no real lectures, we were just asked to review the slides and reading material. This was very disappointing and made it hard to stay motivated. In future I hope there will be”

DTU

