

Claus Thorp Hansen

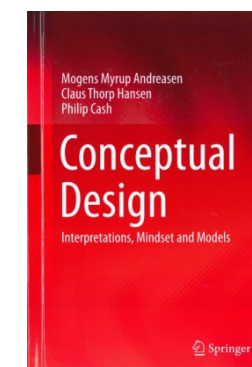
Implementation of a formative, two-stage feedback practice

Course: 41061 Arenas and concepts

Claus Thorp Hansen

Associate Professor, Ph.D.

- A home grown DTU guy
- M.Sc. EE, Ph.D. numerical analysis
- 1988: Institute of Engineering Design
→ DTU Mechanical Engineering
- **Research topics:** Engineering design methodology, machine system theory, conceptualisation.
- **Teach** engineering design: creative and systematic synthesis.
- Proposed, developed and implemented the **Design & Innovation education**.
- **Involve my students** in formulating learning objectives of their Master Thesis.
- Several **publications on engineering education**.



Hands-on session



Introduction (10 minutes)

- The *feedback practice* will be described,
- empirical *data to evaluate its effectivity* will be presented, and
- some *reasons for the feedback practice's effectivity* will be discussed.

Hands-on activity (60 minutes)

- The participants will be grouped into smaller groups. Each group will select a course and redesign it using the presented feedback practice as inspiration.

Discussion and conclusion (20 minutes)

- The participants discuss the result of the hands-on activity and share their experiences focusing on the question:
 - how can you implement elements of the practice in your own teaching?

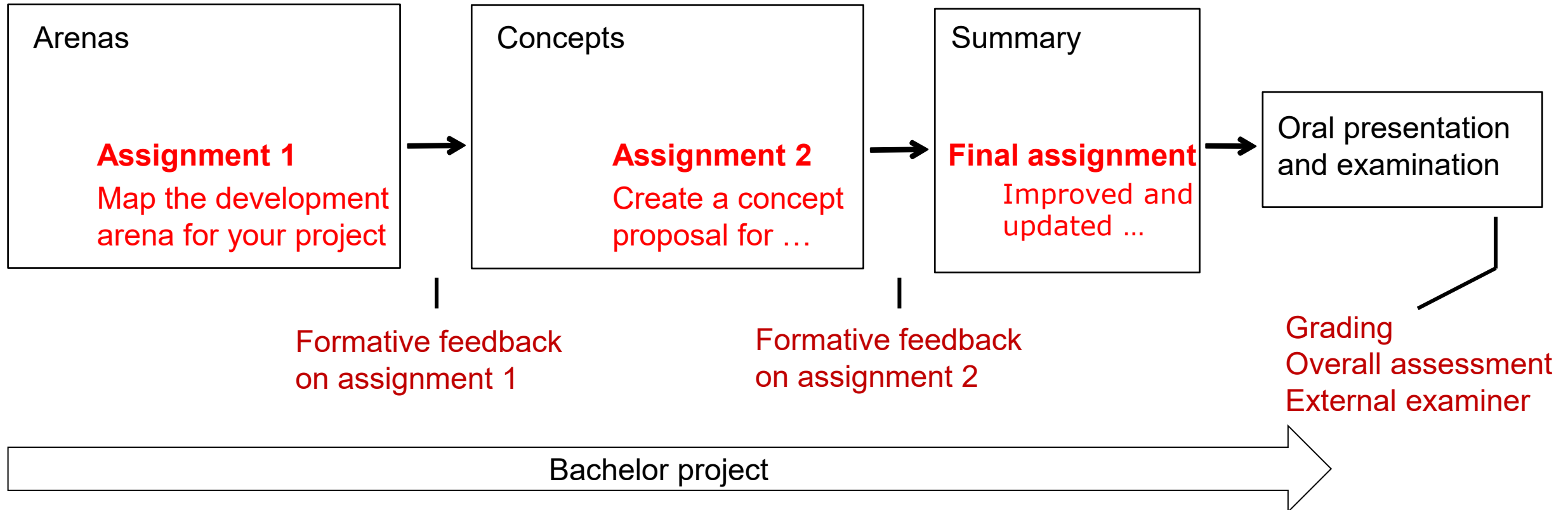
A course in parallel with the bachelor project

Point	5	10	15	20	25	30
Semester	1	41010 (E4A og E5A og Jan.) Orienteret design	42011 (E3A) Produkters brug og design	41012 (E4B) Visuel kommunikation	01005 (E1A og E2) Matematik 1	
Bachelor	2	41020 (F5, F3A og juni) Produktanalyse og redesign		42021 (F4A) Teknologi-analyse	01005 (F1A og F2) Matematik 1	
F201	3	41061 Arenas and concepts: A theory course which is <i>subject integrated</i> with the bachelor projects				41618 (E5B) CAD for designingeniører (anbefalet)
E2015	4	41030 (F5B og juni) Design af mekatronik	42042 (F4A) Brugerinvolveret systemdesign	41045 (F3A) Termo-dynamisk modellering	41035 (F1B) Dynamisk svir	02631 (F2B)
F2016	5					
E2016	6	Konceptfornyelse (Bachelorprojekt)		41061 (F2B) Arenaer og koncepter		miljøforhold (anbefalet)
F2017	7					41312 (E3A eller F3A) Fluid Mekanik

Course structure

Key content:

The development arena and concept proposals



The feedback process

- Feedback the week after hand in.
- Both *teacher* and *teaching assistant* provide feedback
- First, the teacher provides *systematic written feedback*.
- Second, time to *oral feedback (discussion)* with teacher. The bachelor group asks questions and makes comments on the written feedback.
- Third, time to *oral feedback* with teaching assistant: What do I believe you can do better in the Final assignment.

41061: Arenaer og koncepter
Danmarks Tekniske Universitet

Feedback to assignment 1 “Map the development arena for your project”

Gruppe: 5; Studerende: NN1 og NN2

<u>Disposition</u> 10.300 anslag – li; Flot rød tråd gennem besvarelsen. Velstruktureret og velskrevet.	<i>Outline (first hand impression)</i>
1. Beskrivelse: 1) Metal er ... af materialer. 2) Plastik er ikke en teknologi, det er en klasse af materialer. Teknologi er måder at gøre ting på; f.eks. kan man tørre tøj efter vask ved dryptørring (en teknologi) eller tumblertørring (en anden teknologi). 3) Det er måske vigtigere, at I præsenterer for <i>relevante aktører</i> end for interesserede. God beskrivelse af jeres bachelorprojekt med den udfordring I ser og jeres motivation.	<i>Question 1</i>
2. Beskrivelse: 4) En aktør ... instituerende elementer: A common concern, commitment to action og shared objects. I skal huske at inddrage alle tre elementer i jeres beskrivelse af aktørverdener i slutopgaven. 5) En udviklingsarena konfigureres ved aktørverdener og deres kontroverser. Her identificerer I faktisk en kontrovers; så skriv eksplicit, at det er en kontrovers. 6) I skal lade være med at anvende fodnoter af to grunde: For det første stammer fodnoter fra en for længst forældet teknologi, nemlig at sætte i bly, og for det andet skærper I jeres akademiske evne ved at undgå fodnoter, for så skal I nemlig tage stilling til, hvad der er betydningsfuldt, og hvad er ikke. 7) Det er godt, at I sætter kursets begreber <i>controversies</i> og <i>path dependency</i> i kursiv for at fremhæve dem, men det forvirrer denne læser, at translation ikke er i kursiv medens <i>cost calculation parameters</i> er. Prøv at sætte kursusbegreber i kursiv, men hold eksempler fra jeres empiri i almindelig tekst. Flot analyse. Meget god brug af materiale fra bachelorprojektet, og flot anvendelse af kursets begreber.	<i>Question 2</i>
3. Fremtidige i: 8) ... talt med ... interviews, observation, roll the snowball. Meget flot redegørelse for implikationer. Flot i indhold, og overbevisende i begrebs-anvendelse.	<i>Question 3</i>
<u>Begrebs-/termini</u> Omfattende: Man; Overbevisende: Begreber anvendes korrekt og sikkert.	<i>Use of terminology and models</i>
<u>Samlet vurdering</u> Fremragende besv. Holde niveauet/forbedre besvarelsen.	<i>Overall assessment</i>

Venlig hilsen
Claus Thorpe Hansen
19. marts 2020

Formulation of feedback

We need to *enroll* the unaligned green transition actors around *to action*; replacing metal single-use products with *doing this*, we also need to take the primary concern into consideration, so our product is of a satisfactory quality for most likely to be at a reasonable price for Region H, seems profitable for companies, and is easy to handle and preferably rec

Comment [h1]: Needs work

As the *translator-spokesmen*, we need to have good argument in the actor worlds through *problematization*. In this problematic different roles to the actors. We do not actually see it as optimal to become irreplaceable in the long run, as we will have to pass the project. We need to pass the torch to other actors.

Comment [h2]: ???

- We will enroll medical personnel as *co-designers*, hopefully resulting in them getting convinced that plastic is a better alternative. They are already problematizing throwing away plastic, hopefully they will experience our plastic as a better alternative, give us support and data/statements we can pass on to

Comment [h3]: Not sure where this is going

- Actors in Region H should be enrolled as new spokespeople. Region H are already spokespersons on behalf of medical companies. We need to find actors who can present them with our user tests, LCA data and convince them of our problematization, and medical companies.

Comment [h4]: Restructure

- We will present our findings to actors in the medical industry. We will see an opportunity and become new *developers* in

Comment [h5]: This doesn't make any sense

We hope to see a displacement in thoughts about what *plastic* is, seeing that the current path towards using much more single-use plastic is not sustainable without compromising quality and price. We hope

Comment [h6]: Rewrite

Student: "This does not make sense."
Not helpful comments

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<u>Samlet vurdering</u> Fremragende besv Holde niveauet/forbedre besvarelsen.	<u>Overall assessment</u> på mine kommentarer 4, 5 og 7 for at

The three C's of feedback:
Caring, Concrete and Constructive

Benefit: How effective is the feedback practice? (1)

The students' evaluation of the course (Schema A)

	Question 1.1	Question 1.2	Question 1.3	Question 1.4	Question 1.5	Question 2.1	Answers
	<i>Learned a lot</i>	<i>Learning obj.</i>	<i>Motivation</i>	<i>Get feedback</i>	<i>Expectations</i>	<i>Workload</i>	
F 20	4.0; 4.1; 3.9	4.2; 4.2; 4.0	4.3; 3.9; 3.7	4.7; 3.7; 3.6	3.9; 3.8; 3.6	2.7; 3.4; 3.4	32%
F 21	4.2; 4.1; 4.0	4.5; 4.2; 4.1	4.2; 3.8; 3.6	4.8; 3.7; 3.6	4.0; 3.9; 3.6	3.4; 3.4; 3.4	87%

Legend: x.y Average of this course; y.x Average of the department; z.x Average of DTU

- High student satisfaction in general.
- Question 1.4 “During the course, I have had the opportunity to get feedback on my performance” *the course is remarkably better* than the department’s average as well as the DTU average.

Benefit: How effective is the feedback practice? (2)

The grade profile

	F 20		F 21	
Grade	Number	Percent	Number	Percent
12	13	27.7	13	44.8
10	14	29.8	12	41.4
7	11	23.4	3	10.3
4	7	14.9	0	0
02	1	2.1	0	0
00	0	0	0	0
-3	1	2.1	1	3.4
Total	47	100	29	100
Average	8.5		10.6	

- *More than 50%* of the students obtain grades 10 or 12.

Cost

- Number of students in Arenas and concepts: 30 – 45 working in their bachelor groups.
- The teacher: 3 working days to read and comment on the assignments.
- Teaching assistant: 7.25 hours to prepare for oral feedback.
- Cost/Benefit:
 - A very effective formative, two-stage feedback practice!
 - A good investment of teacher and teaching assistant resources.

Why is the feedback practice effective?

- Course terminology and models are applied to *a relevant and interesting problem*: the bachelor project. Increases student motivation.
- *Feedback the week after* hand in. Students remember their assignments.
- Two-stage process: Based on the assignments and the feedback, students are given the *opportunity to prepare improved* descriptions.
- *Only formative feedback* is provided – no partial grades. When grades are included in a feedback process students lose awareness of how to improve their work.
- The amount of text allowed in each of the assignments is 4 pages: Students have *to critically review their two first assignments* in order to shorten text, strengthen argumentation and improving application of terminology and models.

Summary

A very effective formative, two-stage feedback practice!

- The feedback process:
 - The *students carry through the assignment* and hand in their paper
 - The *teacher reads and comments* the paper; comments are mailed to students
 - The *students study the comments* to prepare for feedback discussion
 - *Students and teacher meet for a feedback discussion*; students set the agenda
 - *Students revise their work* and hand in an improved paper
 - The improved paper is the basis for evaluation (grading or pass/fail).
- The formulation of feedback – both written and orally – has to be:
 - *Caring, Concrete and Constructive* – the three C's of feedback

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Introduction (10 minutes) ✓

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Hands-on activity (60 minutes)

- The participants will be grouped into smaller groups.
- Each group selects a course and *redesign it using the presented feedback* practice as inspiration.

Discussion and conclusion (20 minutes)

- The participants discuss the result of the hands-on activity and share their experiences focusing on the question:
 - *how can you implement elements of the practice in your own teaching?*

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Discussion and conclusion (20 minutes)

- The participants discuss the result of the hands-on activity and share their experiences focusing on the question:
 - *how can you implement elements of the practice in your own teaching?*
 - *are you ready to start implementing elements of the practice? why or why not?*
 - *which reflections will you like to share?*