Formative assessment, design based research and digital competence in higher education

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Assessment in Higher Education - National Conference
Kristiansand, UiA
October, 16th -17th 2017

«(…) Context is not always everything, but it colors everything" (Pajares 2006, p. 342).

Outline

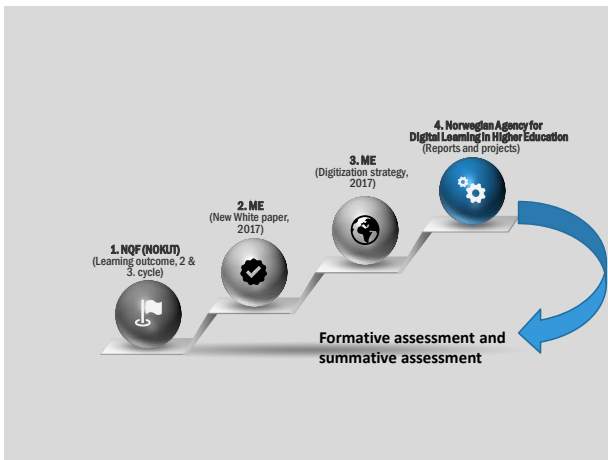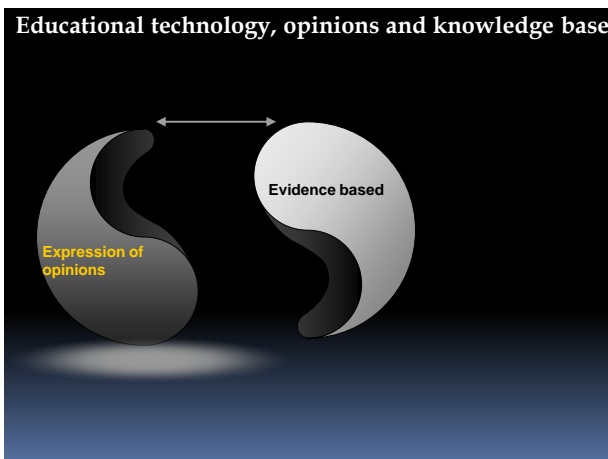|	
1	**Formative assessment in the digital era**
2	**Digital competence and assessment**
3	**Three case studies**
4	**Transferable skills and assessment**

Introduction

We are in a time of upheaval: New white paper "The White Paper on Quality in Higher Education (KD 2017), Norwegian Qualifications Framework (2014), Digitization Strategy for universities and university colleges (2017) and research in higher education

"Increasingly, digitization is linked to education quality. Particularly high activity has been when it comes to digitizing the exam. Work is also being done on the development of new digital assessment methods" (KD 2017, p. 7).

To succeed with this, professional digital competence has been given an important focus in these policy documents as a transferable skill (Krumsvik & Jones 2017)

4. Norwegian Agency for
Digital Learning in Higher Education
(Reports and projects)

3. ME
(Digitization strategy, 2017)

2. ME
(New White paper, 2017)

1. NQF (NOKUT)
(Learning outcome, 2 & 3. cycle)

Formative assessment and summative assessment

Educational technology, opinions and knowledge base

Evidence based

Expression of opinions

2002

"Technology alone does not lead to educational innovation or better learning" (Krumsvik 2002, p. 32)

2015

"(...) we have not yet become good enough at the kind of pedagogies that make the most of technology" (OECD 2015, p. 5)

2015

"(...) adding 21st-century technologies to 20th-century teaching practices will just dilute the effectiveness of teaching" (OECD 2015, p. 5)

Measures..?

Change implementation strategies from "Ad hoc incrementalism" and attach it to «deeply entrenched structures» (Cuban, Kirkpatrick, & Peck, 2001)

Change the teacher's role from the "sage on the stage" to the "guide on the side" (Van Dusen, 2000, p. 14) by increasing the repertoire

Technology makes it possible to move away from traditional six-hours, anxiety-ridden summative assessment to new assessment forms. However, this is a moving target….

What is the learning objective and what should be assessed?

1	Theory	⟷	Practice
2	Processes	⟷	Learning outcome
3	Surface	⟷	Deep
4	Auth. Experience	⟷	Abstraction

What is the learning objective and what is the best teaching form for different learning purposes?

"FLIPPING OR FLOPPING"…?
«CHALK AND TALK»….?
«TELLING AND SHOWING"….?
«LEARNING BY DOING»…?
OR A COMBINATION?

What about research on educational technology?
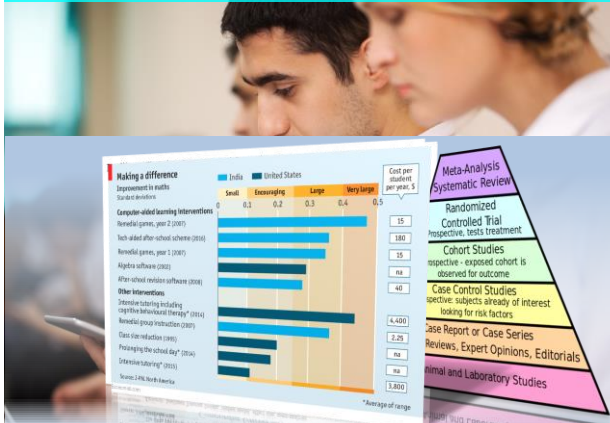
Examples from 3 case studies

Large lectures are criticized, but will probably be a part of higher education for ever.

Every university lecturer has experienced the same problem: how to reach the students in large lectures when there are several hundred students.

Students in large classes are often unwilling to speak up because they fear:

*public mistakes or embarrassment,
*pre-existing expectations of passive behavior in a lecture course,
*uncertainty of acceptable behavior in a class that may be larger than one's own hometown

Case study 1

The main aim of the case study is to examine if, and eventually how design based research (with video cases, peer discussions, formative assessment and student response systems) can make it possible for students to receive formative feedback in large lecturs?

"When the cook tastes the soup, that's formative; when the guests tastes the soup, that's summative" (Schriven 1991, s. 169).

Egelandsdal & Krumsvik (2017): large lectures

Peer discussion → Learning outcome (d=0.66)

Design based research, formative assessment and peer discussion (psychology students).
(Smith et al., 2009; Deslauriers, Schelew og Wieman 2011)

Ludvigsen, Krumsvik & Furnes (2015): large lectures

Creating formative feedback spaces in large lectures
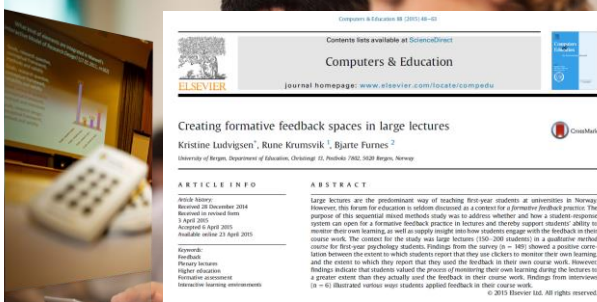
Formative feedback spaces in large lectures (psychology students).

Example: Bridging theory and practice for psychology students (N= 172)

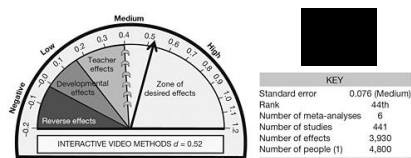- "Interactive video, a combination of computer-assisted instruction and video technology, is used as an instructional media for teaching and training" (Hattie 2009, p. 228).

INTERACTIVE VIDEO METHODS d = 0.52

KEY	
Standard error	0.076 (Medium)
Rank	44th
Number of meta-analyses	6
Number of studies	441
Number of effects	3,930
Number of people (1)	4,800

Example: Video case - Intuition versus research evidence

Videocase: What do you think is the correct answer in this video case? (N=162)

1. You can see the most of your body when you stand far away from the mirror
2. You can see the most of your body when you stand close to the mirror
3. You look as much of your body regardless of the distance you have
4. I don't know

72%

11%   15%   2%

1.   2.   3.   4.
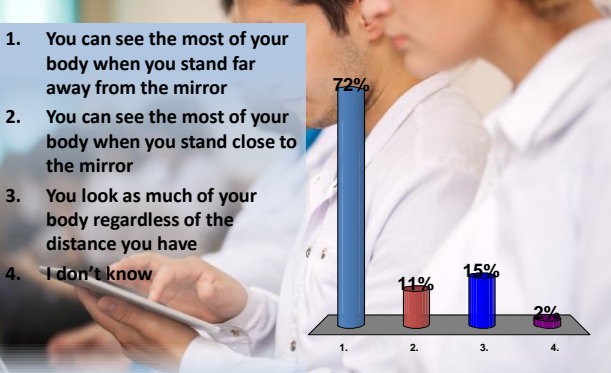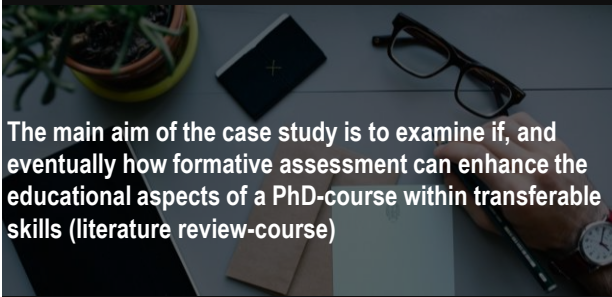
Case study 2:

The main aim of the case study is to examine if, and eventually how formative assessment can enhance the educational aspects of a PhD-course within transferable skills (literature review-course)

The case study: Digital competence as transferable skill (3rd cycle)

Flipped classroom

A variety of digital tools (21)

Formative e-assessment

The pedagogical framework of the course

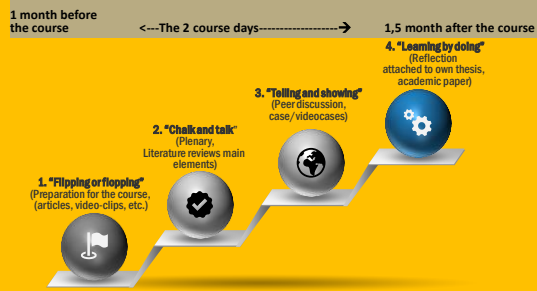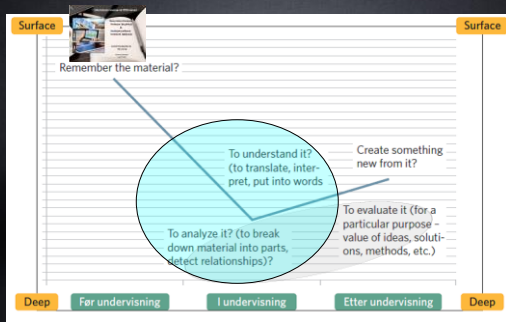1 month before the course <---The 2 course days-------------------> 1,5 month after the course

4. "Learning by doing"
(Reflection attached to own thesis, academic paper)

3. "Telling and showing"
(Peer discussion, case/videocases)

2. "Chalk and talk"
(Plenary, Literature reviews main elements)

1. "Flipping or flopping"
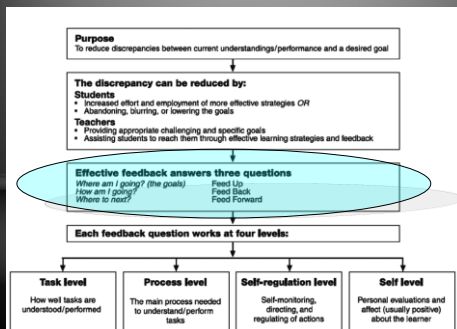(Preparation for the course, (articles, video-clips, etc.)

PhD-candidates' formative assessment of the pedagogical framework and the content of the PhD-course (3 times)
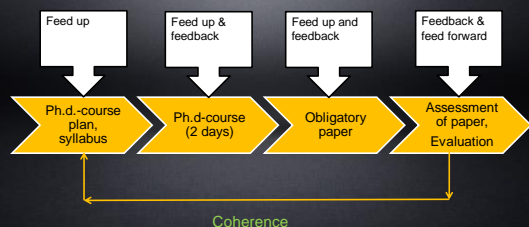

Pedagogical framework: Flipped learning design

Surface   Surface

Remember the material?

To understand it?
(to translate, inter-pret, put into words

Create something new from it?

To evaluate it (for a particular purpose – value of ideas, soluti-ons, methods, etc.)

To analyze it? (to break down material into parts, detect relationships)?

Deep   Før undervisning   I undervisning   Etter undervisning   Deep

(Bishop and Verleger 2013)

Theoretical framework: Formative assessment
(Hattie & Timperley 2007, p. 87)

Purpose
To reduce discrepancies between current understandings/performance and a desired goal

The discrepancy can be reduced by:
Students
• Increased effort and employment of more effective strategies OR
• Abandoning, blurring, or lowering the goals
Teachers
• Providing appropriate challenging and specific goals
• Assisting students to reach them through effective learning strategies and feedback

Effective feedback answers three questions
Where am I going? (the goals)   Feed Up
How am I going?   Feed Back
Where to next?   Feed Forward

Each feedback question works at four levels:

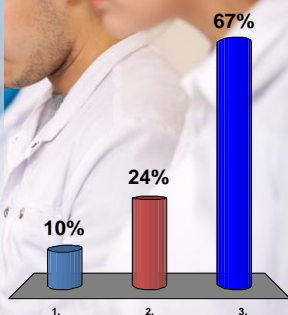| Task level	Process level	Self-regulation level	Self level
How wel tasks are understood/performed	The main process needed to understand/perform tasks	Self-monitoring, directing, and regulating of actions	Personal evaluations and affect (usually positive) about the learner

Feed up, feed back and feed forward (Hattie and Timperley 2007) in digital learning communities

Literature review on PhD-level

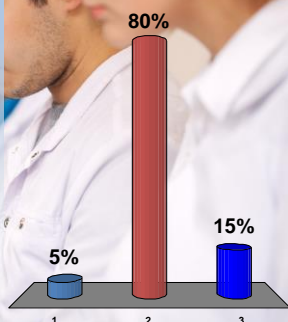| Feed up | Feed up & feedback | Feed up and feedback | Feedback & feed forward |

| Ph.d.-course plan, syllabus | Ph.d-course (2 days) | Obligatory paper | Assessment of paper, Evaluation |

Coherence

Have you read the recommended literature for the course?

1. No
2. Yes
3. Partly

10% 24% 67%

1. 2. 3.

Have you watched the 6 video clips before the course ("Flipped learning")?

1. No
2. Yes
3. Partly

5% 80% 15%

1. 2. 3.

Digital elements (flipped classroom) in PhD-courses

Evaluation of "Literature review on PhD-level", 30.-31. March 2017

Q6 To what extent do you think watching the 6 video clips supported your own learning outcome in the course?

Besvart: 22 Hoppet over: 0

High extent

"The video clips were precise and helpful supplements to the articles and the topic of the course. I think they can serve as useful guidelines when conducting a review of my own" (Sarah)

Peer discussions and e-formative elements (Flinga) in the PhD-course

Evaluation of "Literature review on PhD-level", 30.-31. March 2017

Q8 To achieve the main goals for the course we had some peer discussions and Flinga-cases ("Telling and showing") about the main elements of literature review during the two course days. To what extent do you think the peer discussions and Flinga-cases supported your own learning outcome of the course?

Besvart: 22 Hoppet over: 0

High extent

Low extent

0%   10%   20%   30%   40%   50%   60%   70%   80%   90%   100%

Obligatory paper, assessment part 1: feed back

Obligatory paper, literature review at PhD-level
by
Professor Rune Johan Krumsvik & associate professor Fredrik Mørk Røkenes

Assessment, NN

This is an impressive, well-written and nearly complete narrative review that clearly shows how you are capable of positioning your doctoral work in the forefront of knowledge in your research field. You clearly identify a knowledge gap in the literature that justify why you want to conduct a literature review. We want to applaud you for being very thorough and transparent with the method both in the retrieval and the review stages of your review. The tables, figures and appendices support and inform your review and your argumentation, and we especially like that you designed a flow chart to show the different stages of the retrieval stage.

Obligatory paper, Assessment part 2: feed forward

"Thank you so much for the feedback in my paper! It is educational and encouraging. I will use it actively further on when revising my paper" (Mark)

2. Method

This study will take the form of a narrative/traditional review of the literature, as part of an ongoing PhD-thesis. A narrative review is meant to systematically investigate, summarize and assess previous literature (Krumsvik & Røknes, 2016)
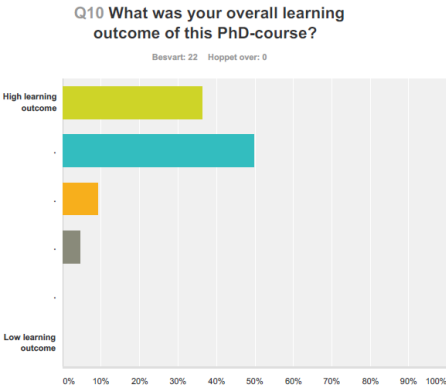
Search strategy:

An extensive search for published literature of the last 30 years was conducted. The primary databases searched were Embase, Medline and PsychINFO. The search strategy used was: (adolescen* OR youth OR teen* OR children OR young) AND trend* AND (internaliz* OR complaint* OR psychosomatic OR mental OR subjective health). All searches were within article title and abstract. Several complementary searches were performed to insure a sufficiently broad search strategy using an adjusted syntax. These databases were Web of Science and for Scandinavian literature SweMed and the Norwegian source "Helsebiblioteket" were searched.

Kommentert [A3]: Maybe include a definition of this term so that the reader knows exactly what you mean by this label?

Kommentert [A4]: In this paper, you could have elaborated a bit on what the main aim and research question is in your doctoral project. However, this is also easy to read from your review focus.

**Kommentert [A5]:** Krumsvik & Røknes, 2016

Evaluation of the course

Q10 What was your overall learning outcome of this PhD-course?

Besvart: 22   Hoppet over: 0

Case study 3:

The main aim of the case study is to examine if, and eventually how using formative assessment elements (as video cases, peer discussion and student response systems) can raise the awareness of good professional communication skills in practise periods among dentist students.

Feedback (Hattie & Timperley 2007)

Feed up

Feedback

Feed forward

Students and supervisors
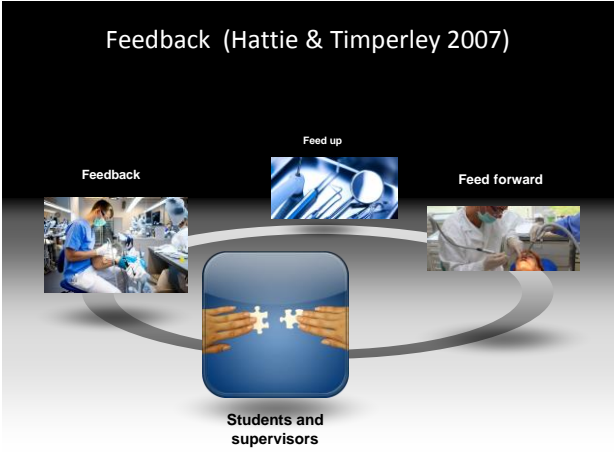
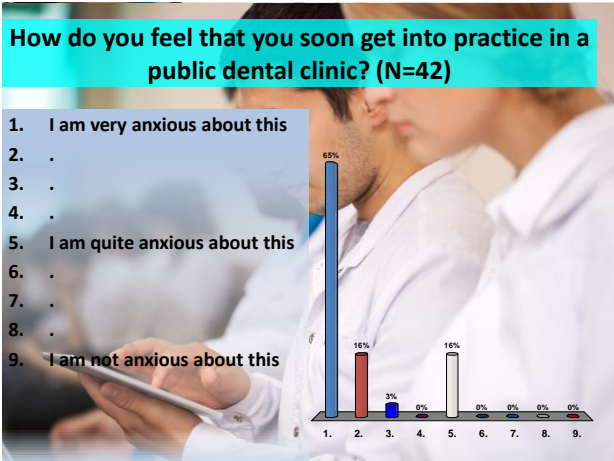## Dentist students and formative assessment

Professional communication with patients and supervisors are essential parts of becoming a dentist.

Especially important is the professional communication between dentist students and patients, since *Odontophobia* is one of the most common phobia in the Norwegian population (Støylen 2015).

A systematic review of communications skills in dental education show that dentists' communication skills can reduce stress, anxiety and Odontophobia among patients (Carey, Madill & Manogue 2010).

Dentist students expressed that they were quite nervous and tense before the practice period because they didn't have any first hand experiences with dealing with "real patients" in public dentist clinics

As one dental students said; "we have to master three challenges at the same time - we must establish a good communication with the patient, with the supervisor/instructor and at the same time fix the patient's teeth".

How do you feel that you soon get into practice in a public dental clinic? (N=42)

1. I am very anxious about this
2. .
3. .
4. .
5. I am quite anxious about this
6. .
7. .
8. .
9. I am not anxious about this

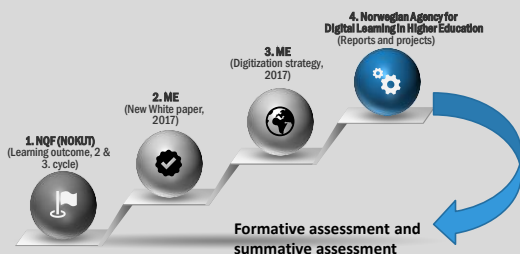65% 16% 3% 0% 16% 0% 0% 0% 0%
1.   2.   3. 4. 5.   6. 7. 8. 9.

Dentist students and formative assessment

These results gave a moment of contingency defined as moments "in which the direction of the instruction will depend on student responses" (Leahy, Lyon, Thompson & Wiliam, 2005, p. 6).

Then the lecturer encouraged the dentist students and supervisors to comment on the results (bar charts) on the screen as these are highly relevant for their later meetings during this one-day seminar, but also for the upcoming practice periods.

As expected, none of them commented ☺

Then I asked to use their Smartphones and Flinga (SRS) to comment on why they were so nervous before the practice period

Dentist students and formative assessment

- With communicating and visualizing all the answers generated by the dentist students' video case questions the lecturer tried to;
- 1) to bridge some of the gap between theory and practice
- 2) to establish collective culture for communication and "sharing and caring" in the auditorium
- 3) to raise the awareness around the tension and stress dentist students feels before the practice periods
- 4) to prepare the supervisors for their individual meeting with the dentist students later at the seminar
- 5) the importance for students dentists to learn such professional communication strategies mediated through technological artefacts and face-to-face for their future job.

Summary

1. NQF (NOKUT)
(Learning outcome, 2 & 3. cycle)

2. ME
(New White paper, 2017)

3. ME
(Digitization strategy, 2017)

4. Norwegian Agency for Digital Learning in Higher Education
(Reports and projects)

Formative assessment and summative assessment

Summary

1	**What is the learning objective and what should be assessed? Where, when, how….**
2	**Digital competence and assessment**
3	**Increasing the university teachers' repertoire**
4	**Transferable skills and assessment**

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