Faculty of Educational Sciences

International Trends with examples from Teacher Education in Norway

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CENTRE FOR EXCELLENCE IN EDUCATION

TEACHERS MATTER

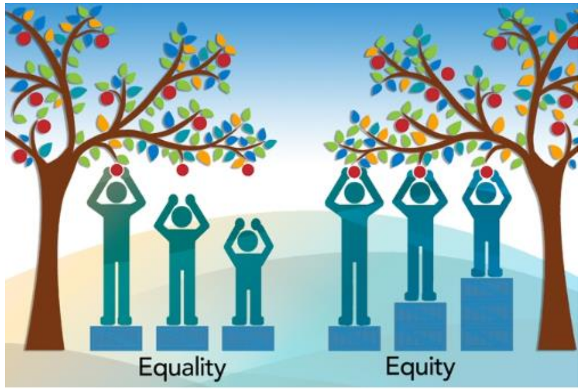
Challenges to Teacher Education Models

1. Professional Model ⟷ University Based
“Craft” based in schools — Research Model

2. Integrated and Coherent ⟷ Fragmented

3. Increasing number of “issues” to be included:

- Education for sustainability,
- Digital competency,
- diverse classrooms,
- And more…..



As we continue into the talk, there are some important questions to reflect on

- Who are the teacher educators in your program?
- How does a students’ personal identity as a professional develop over time in your program? Are students in focus?
- How does your program link campus instruction to classroom practice?
- Does you program have systematic experimentation (research) on and in the teacher education program?

What is going on in Norway and why be interested?

The SFU Initiative in Norway
Centre of Excellence in Higher Education

- Aim to contribute to the development of excellent quality in higher education and to highlight the fact that teaching and research are equally important activities
- A significant element of the initiative is to promote excellence in R&D-based education.
- SFU status is awarded for five years, with the possibility of prolongation for another five years, subject to an interim evaluation.
- In 2011, SFU centre status was awarded to **ProTed**, a collaboration between the University of Oslo and the University of Tromsø.
- Today Norway has 12 centers of Excellence in Education. More coming in 2023.

ProTed

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Our assignment – to think outside of the box

“to serve as a structuring space for **systematic experiments in teacher education** programs that integrate a strong research base and tight collaboration between the practice field and education based on a deep interplay between profession-oriented and scientific components”

(from the first evaluation)

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ProTed

ProTed

Vision

ProTed`s vision is to promote innovative and relevant teacher education programs for future schools. The overarching goal for these efforts is to promote coherent, integrated programs. The centre is a developmental unit, a national provider of insights and an internationally recognized partner for the development of a knowledge base for teacher education. The centre is a catalyst for research and development through systematic interventions, analyses and dissemination.

In order to realize our vision, we build on the following principles:

- Research based development of teacher education
- Systematic work with coherence and progression in studies
- Systematic work with student active learning
- Development of partnerships between universities and schools
- Systematic work to integrate multiple knowledge domains

Together these principles provide a basis for educating professional teachers for the future knowledge society.

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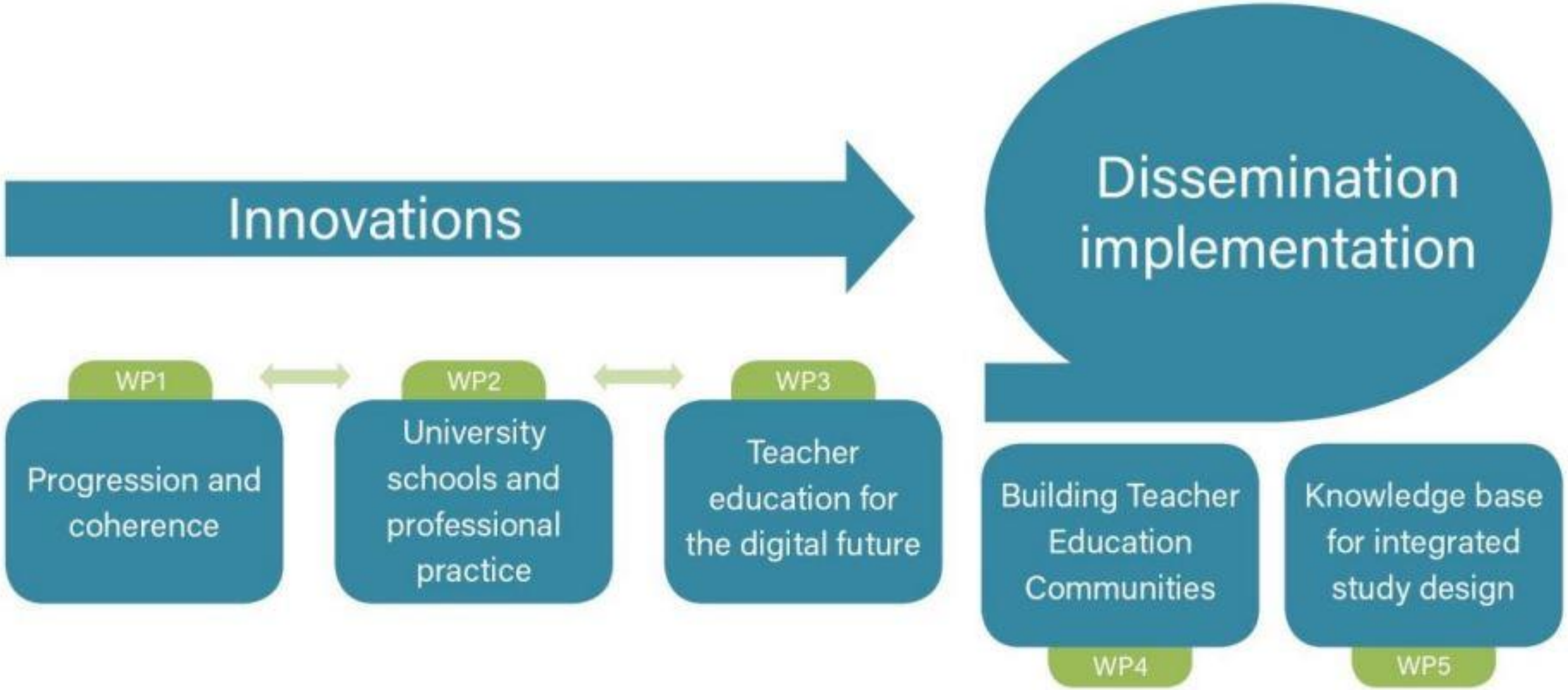
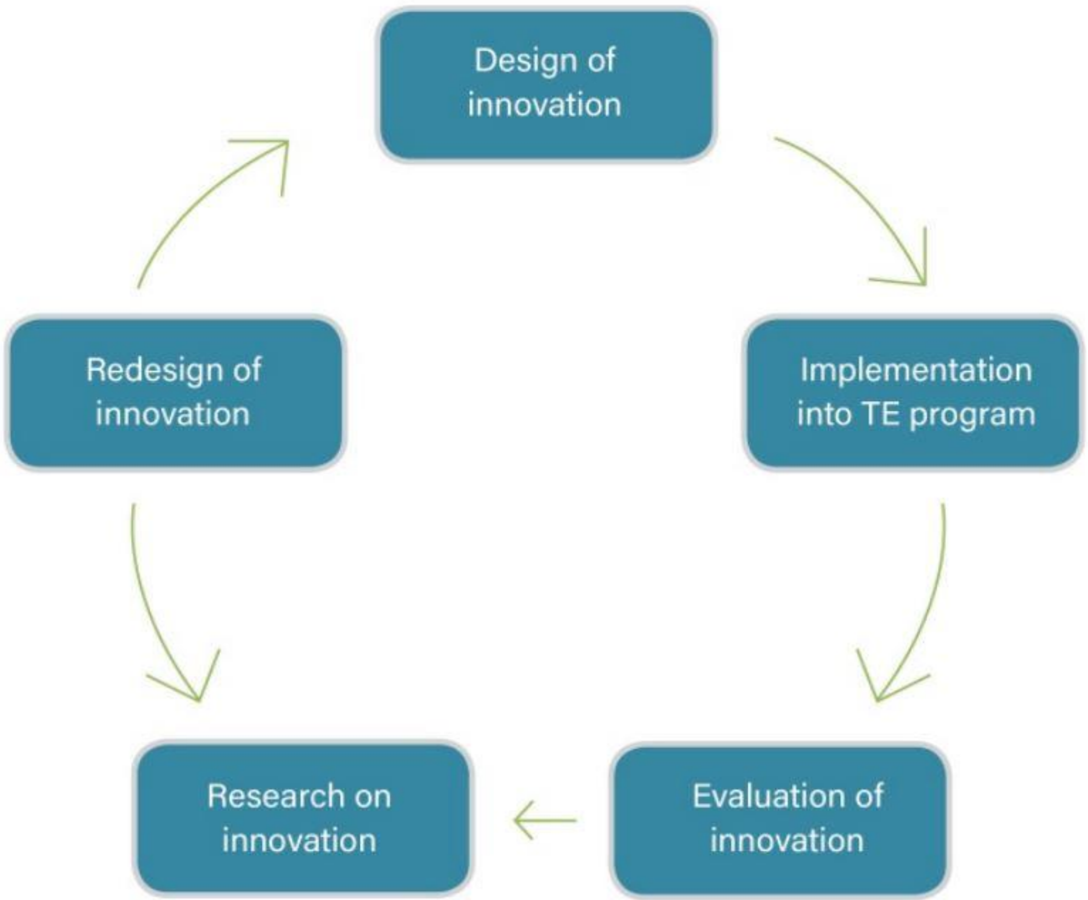
What we do, and how we do it



ProTed

Students professional development – the driving force for innovation



Why discuss transformation in teacher education?

What are the “drivers” for change?

What can we learn from the literature?

A look at what we mean by quality in teacher education programs

Quality indicators that describe:	
1. **Systemic quality** – what precedes the actual educational provision and defines the context before students start learning	
2. **Process quality** – what goes on as students learn	
3. **Product quality**	

Quality indicators that describe:	

1. **Systemic quality** – what precedes the actual educational provision and defines the context before students start learning	- Funding and national standards
	- Characteristics of the student body
	- Enabling inputs like physical infrastructure and facilities, teaching and learning materials and human resources
	- Design of the study program and work related to program design, assurance, maintenance and enhancement:
	    - Program coherence and integration
	    - Quality work
	    - University-school-partnership
	    - Teachers' professional knowledge base
	    - Continuing education for teacher educators

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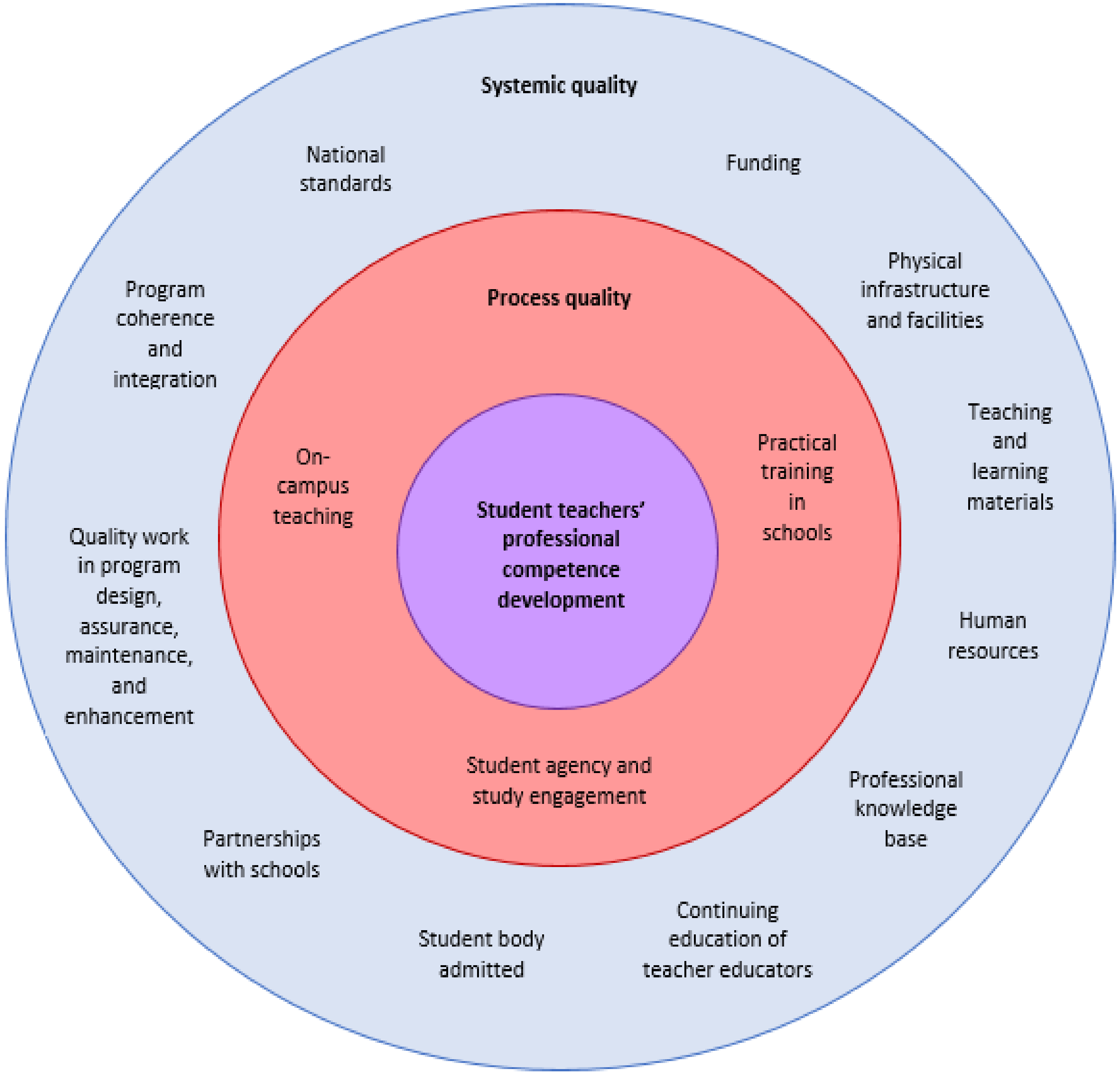
2. **Process quality** – what goes on as students learn	- Student agency and engagement - Learning opportunities provided on campus and in schools (Quality features in on-campus teaching and practical training in schools)
3. **Product quality**	

Ida Hatlevik 2022, NERA conference, Iceland

Quality indicators that describe:

3. Product quality	- The number and characteristics of student teachers graduating, and - the outcomes of their learning and whether they have developed sufficient professional knowledge and competence to be a schoolteacher and are able to participate in further professional competence development in school.



Quality indicators in Teacher Education

Systemic Quality

Process Quality

Product Quality

Ida Hatlevik 2022, NERA conference, Iceland

Innovation –
in all shapes and sizes

Three examples improving Systemic indicators at UiO

1. Innovations connected to the development of an integrated study design

2. Innovations related to digital transformation

3. Innovations together with university schools as partners

Master in physics + one year PPU (pedagogical studies) = 6 years

PPU3220 - PPU del 2 av 2: Vurdering og tilpasset opplæring		
PPU3210 - PPU del 1 av 2: Undervisning og læringsforløp		
Masteroppgave	Masteroppgave	Masteroppgave
Masteroppgave	Masteroppgave	Masteremne
Masteroppgave	Masteremne	Masteremne
Masteremne + 5 HMS emner	Masteremne	Masteremne
Se studieretning	Se studieretning	Se studieretning
FYS2160 - Termodynamikk og statistisk fysikk	Se studieretning	Se studieretning
FYS2130 - Svingninger og bølger	FYS2140 - Kvantefysikk	Se studieretning
FYS1120 - Elektromagnetisme	AST2000 - Innføring i astrofysikk	MAT1120 - Lineær algebra
FYS-MEK1110 - Mekanikk	MEK1100 - Feltteori og vektoranalyse	MAT1110 - Kalkulus og lineær algebra
IN1900 - Introduksjon til programmering for naturvitenskapelige anvendelser	MAT-INF1100 - Modellering og beregninger	MAT1100 - Kalkulus

Five year *integrated* master program

10	Master thesis 30 stp.		
9	Subject 1 or Sci.Edu 1 (10 stp.) 15	Subject 1 or Sci.Edu 1 (10 stp.)	Subject 1 or Sci.Edu 1 (10 stp.)
8	Subject1 or Sci.Edu. 1 (10 stp.)	Subject 1 or Sci.Edu. 1 (10 stp.)	Subject 1 or Sci.Edu. 1 (10 stp.)
7	Teacher education course (30 stp.) 45		
6	Subject 2 (10 stp.)	Teacher education course (20 stp.) 25	
5	Subject 2 (10 stp.)	Ex.Phil (10stp.)	Subject 1 (10 stp.)
4	Subject 2 (10 stp.)	Subject 1 (10 stp.)	Subject 1 (10 stp.)
3	Subject 2 (10 stp.)	Subject 1 (10 stp.)	TE course (10 stp.) 15
2	Subject 2 (10 stp.)	Subject 1 (10 stp.)	Subject 1 (10 stp.)
1	Subject 2 (10 stp.)	Subject 1 (10 stp.)	Subject 1 (10 stp.)

Mentorship Program

5 year integrated Teacher Education program – Science and Mathematics

Mentor program

10	Master thesis 30 stp.			5
9	Fag 1/Fagdid 1 (10 stp.)	Fag 1/Fagdid 1 (10 stp.) 15	Fag 1/Fagdid 1 (10 stp.)	
8	Fag 1/Fagdid 1 (10 stp.)	Fag 1/Fagdid 1 (10 stp.)	Fag 1/Fagdid 1 (10 stp.)	4
7	Professional subject (30 stp.) 45			
6	Fag 1 (10 stp.)	Professional subject (20 stp.) 25		3
5	Fag 1 (10 stp.)	Fag 1 (10 stp.)	Fag 1 (10 stp.)	
4	Fag 2 (10 stp.)	Fag 2 (10 stp.)	Fag 1 (10 stp.)	2
3	Ex.Phil (10 stp.)	Fag 2 (10 stp.)	Prof. Sub (10 stp.) 15	
2	Fag 2 (10 stp.)	Fag 2 (10 stp.)	Fag 1 (10 stp.)	1
1	Fag 2 (10 stp.)	Fag 1 (10 stp.)	Fag 1 (10 stp.)	

Innovations connected to the development of an integrated study design

PROMO: Mentorship Programme

Design as courses, offer in every semester of the 5-year programme

Julia Loge, Uniforum

Professional Courses

Design to integrate pedagogical theory with subject didactic in students subject 1+2 and clinical training

- Common themes for teaching in pedagogy and subject didactic
- Core practices
- Integrated learning outcome descriptions
- Integrated R&D exams, connects experiences from clinical training with theory
- Integrated research literacy

Progression for learning 5-years

- Research literacy
- Professional digital competence
- Clinical training in 4 of 5 years

Ian Menter (BERA):
What is a teacher in the 21st century and what does a 21st century teacher need to know?

Basic Core Practices in teacher education
Also called high-leverage practices

- Leading group discussion
- Explaining and modeling content, practices and strategies
- Eliciting and interpreting student thinking
- Diagnosing common patterns of thinking and development in a subject-matter domain
- Implementing norms and routines for classroom discourse and work
- Coordinating and adjusting instruction during a lesson
- Specifying and reinforcing productive student behavior
- Implementing organizational routines
- Setting up and managing small group work
- Building respectful relationships with students
- Talking about a student with parents
- Setting long and short term learning goals for students
- Designing single and sequences of lessons
- Checking student understanding during and at the conclusion of lessons
- Selecting and designing formal assessments of student learning
- Interpreting the results of student work
- Providing oral and written feedback
- Analyzing instruction with purpose of improving it

Pam Grossman, Karen Hammerness and Morva McDonald
Redefining teaching, re-imagining teacher education (2008)

Ambitious Science Teaching

Builds on general high leverage practices

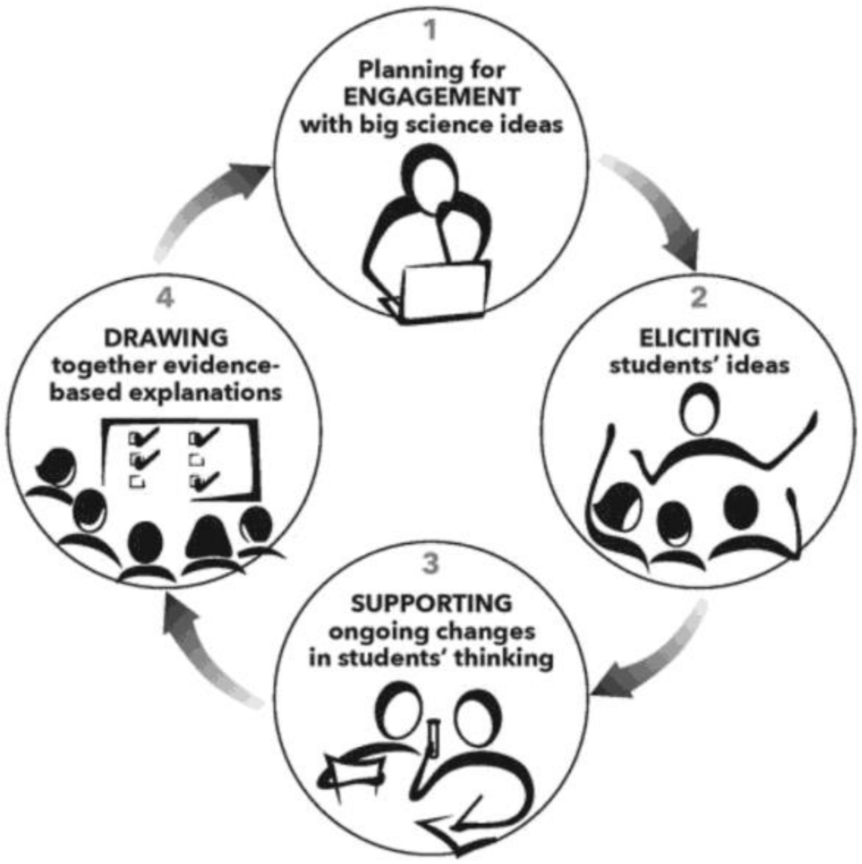
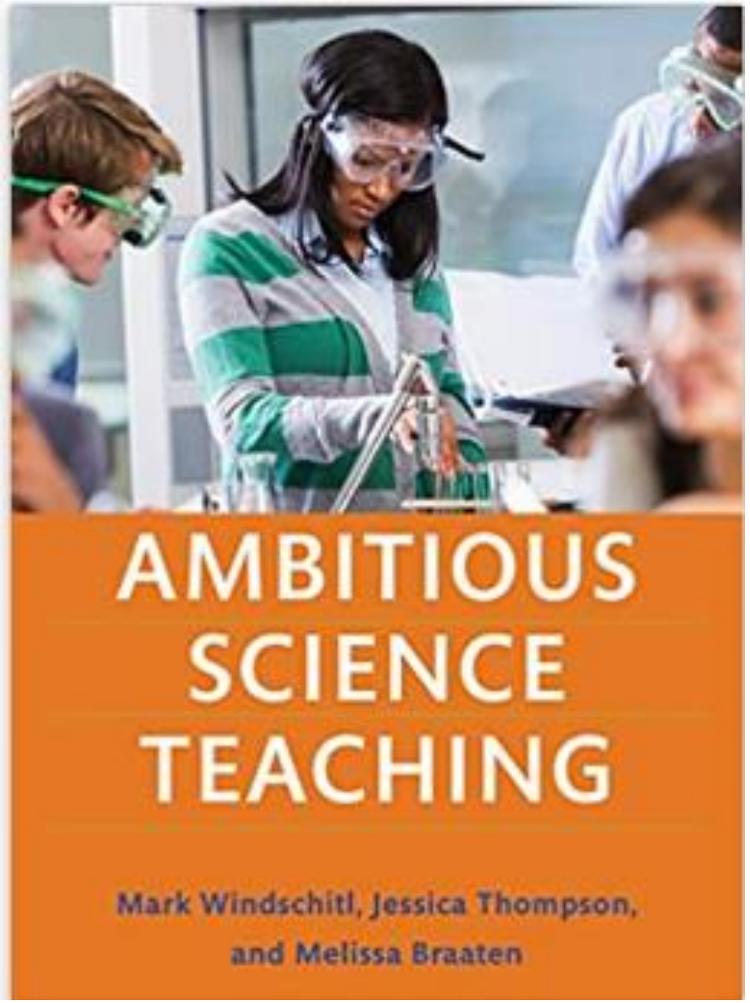


FIGURE 1.1 Ambitious Science Teaching framework



Core Practices in Science

1. Planning for Engagement
    1. Identify big ideas
    2. Select an anchoring event and question
    3. Sequence learning activities
2. Eliciting Students' Ideas(talk, modelling, drawing, writing)
    1. Elicit ideas and activate prior knowledge
    2. Help students represent thinking publically
    3. Adapt further instruction (based on above)
3. Supporting Changes in Thinking
    1. Introduce new ideas
    2. Engage students in activity and sensemaking
    3. Collective thinking (argumentation)
4. Drawing together evidence-based explanations
    1. Co-construction
    2. Pressing for gapless explanations and models
    3. Assessing for understanding

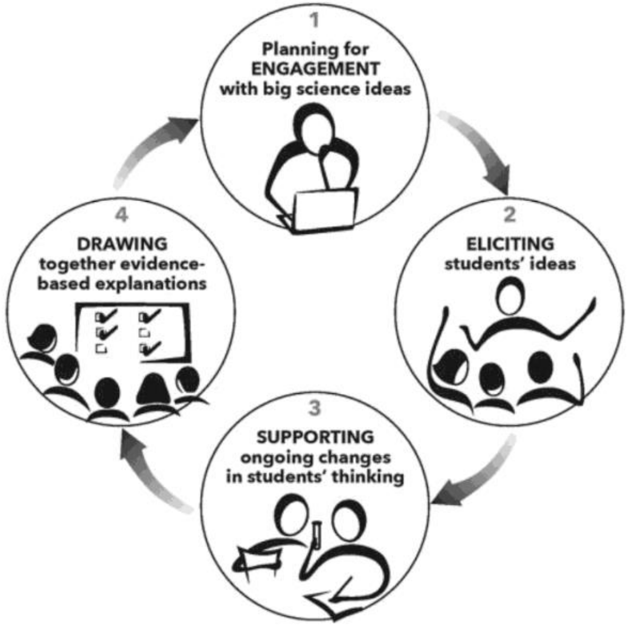
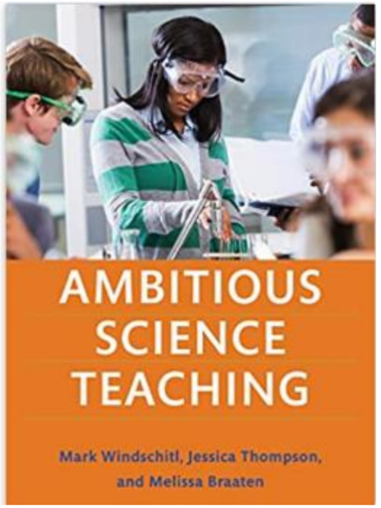


FIGURE 1.1 Ambitious Science Teaching framework



Innovations together with university schools as partners

UiO and UiT were the first universities collaborating with schools in developing an extended model for partnership collaboration in Norway

Teacher Education 2025. **National Strategy for Quality and Cooperation in Teacher Education** (2015)
- Every institution that offers TE is recommended to establish extended models of partnership collaboration

Interim evaluation of ProTed:

- "After thorough consideration of all the evidence it had available, the Expert Committee concluded that, in many areas, ProTed has made significant advances from the point at which it was awarded SFU status.
- This is seen most clearly in its development of the University School concept, which the Expert Committee regard as, currently, 'the jewel in ProTed's crown'.
- ProTed has also made major progress in the curriculum design and practice of research-informed integration in teacher education (with University Schools playing a crucial role in this)."

Why is our university partnership unique?

Developing partnerships with University Schools

Cooperation on study design

- Development and revision of study program
- Development and revision of teaching and assessment forms
- Development and revision of new forms of practice

Cooperation on administration and leadership

- Representative in institute board
- Representative in program board
- Representative in other types of committees

Cooperation on student learning on **campus**

- Teaching, advising and evaluation
- Mentoring in Professional courses

Cooperation on student learning in **practice**

- Advising and evaluation
- Cooperation on student research and development projects

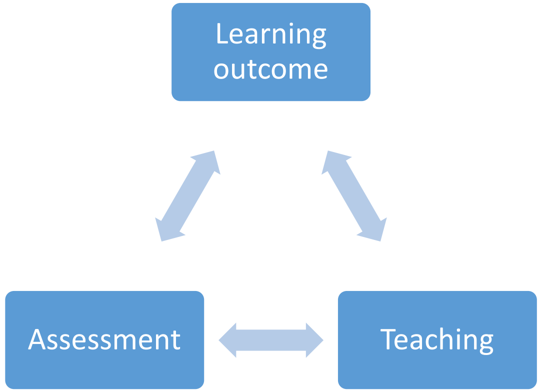
Cooperation on research and development in schools

- Cooperation in research projects
- Cooperation on school development projects
- Cooperation on competence development

Innovations related to digital transformation

Video case exam

Teachers professional competence, what they should be able to know and to do

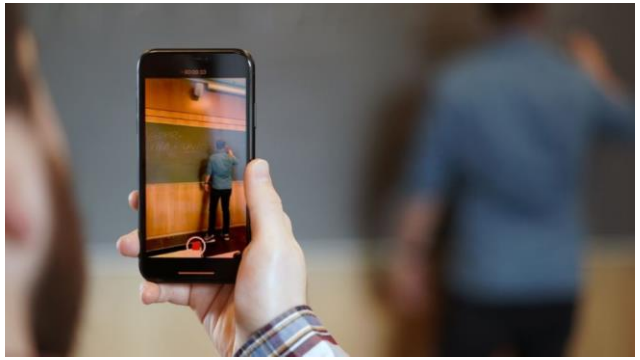


Exam that lets students show their competence

- Video case – a typical situation in a school context
- 5 hours to analyse and discuss using theory from both pedagogy and their field of subject didactics
- All tools and resources available

Visual Vocal Application (VIVA)

ProTed is developing the VIVA app for secure video/audio recordings (GDPR).



The VIVA app can be used to make recordings in supervised professional training, mentoring of colleagues and when collecting data for your master thesis and research, for example when doing classroom research.

Digital integration of video assessment in different arenas (DIVA): The project aims to develop learning designs for peer assessment, formative and summative assessment in higher education, in which digital technology (video) is being utilized as an innovation tool.

Has ProTed had an impact?

- The number of students completing their degrees has increased by more than 50%
- In a national evaluation of teacher education for 8-13, students at UiO report that the program is highly relevant and that it is closely connected to work in schools
- Research on teacher education and our own teaching has increased
- Innovation is added as the third pillar next to research and education

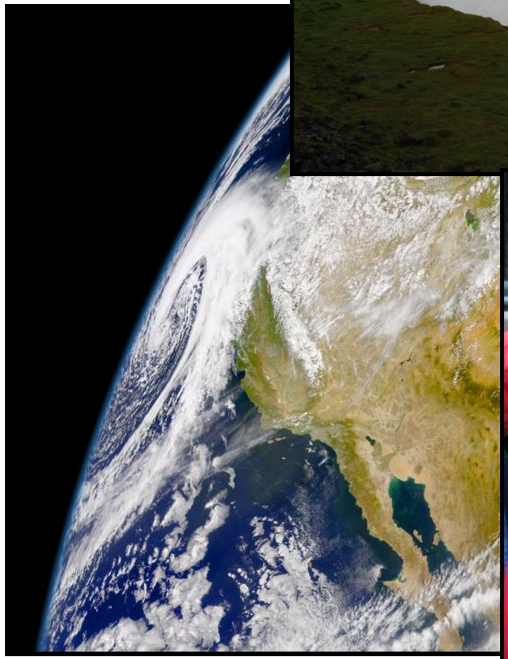
Defining Knowledge Domains for Science Teacher Educators – Educating the educators

- Natural Science
- Science Education
- Science Education Research

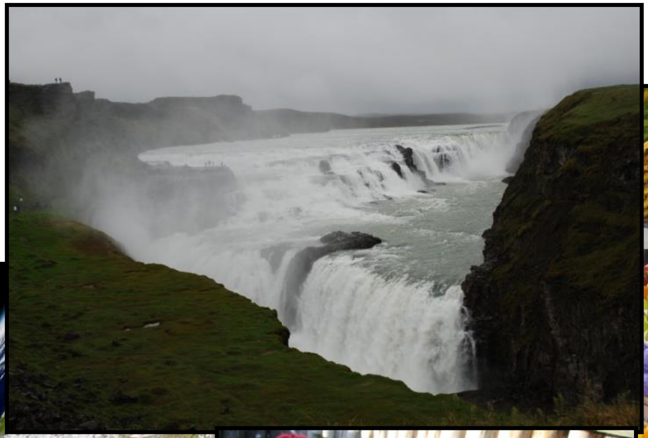
Mork, Sonja Merethe; Henriksen, Ellen Karoline; Haug, Berit; Jorde, Doris & Frøyland, Merethe (2021). Defining knowledge domains for science teacher educators. *International Journal of Science Education*. ISSN 0950-0693. doi: 10.1080/09500693.2021.2006819.

Why Science?

climate



water



food

health

energy

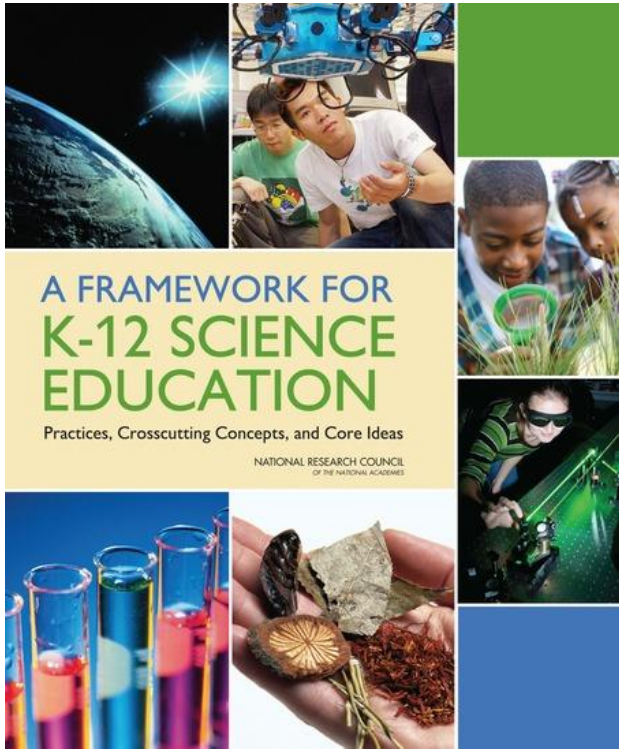
Domain 1. Natural science

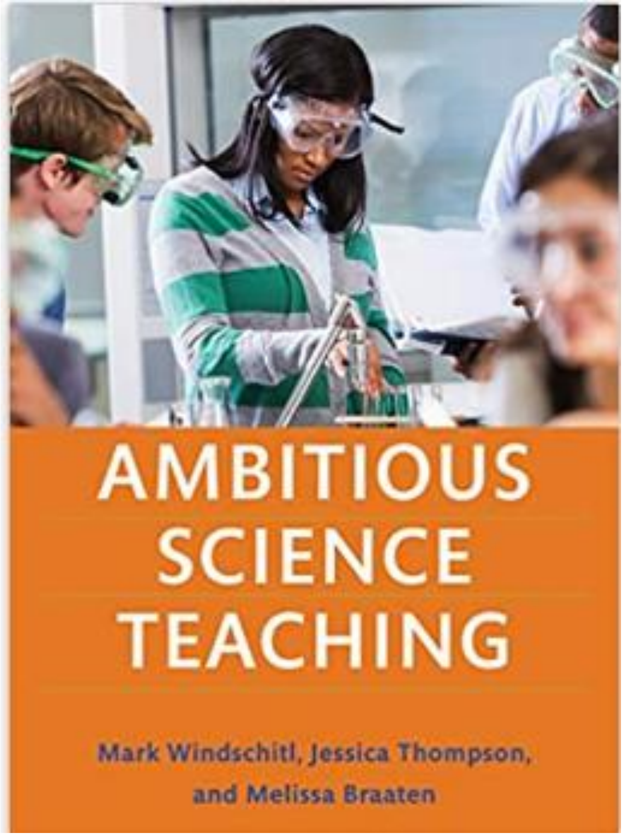
a) Subject matter content knowledge in at least one natural science discipline

b) Knowledge about research practices in science (procedural knowledge)

c) Understanding the Nature of Science, NOS (epistemic knowledge)

Domain 2. Science education





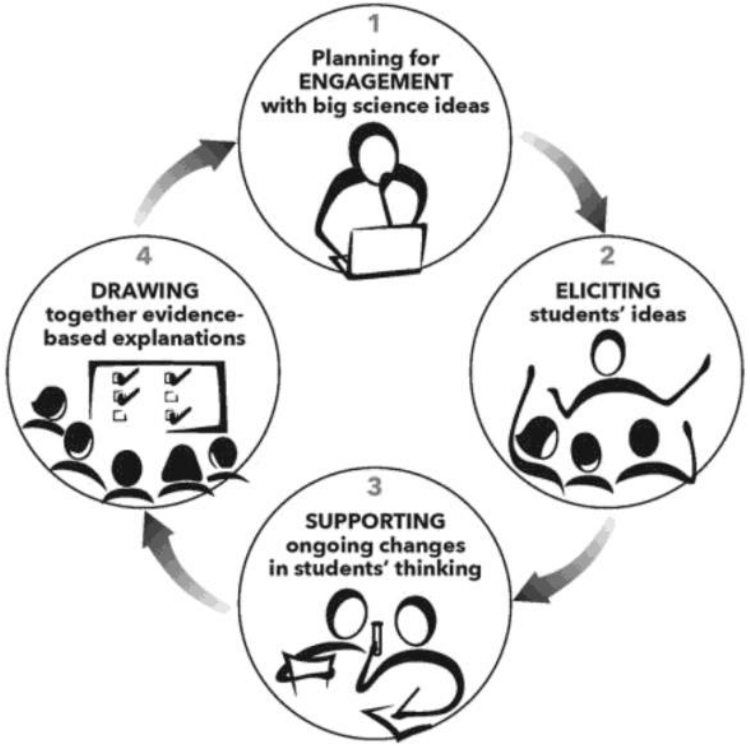


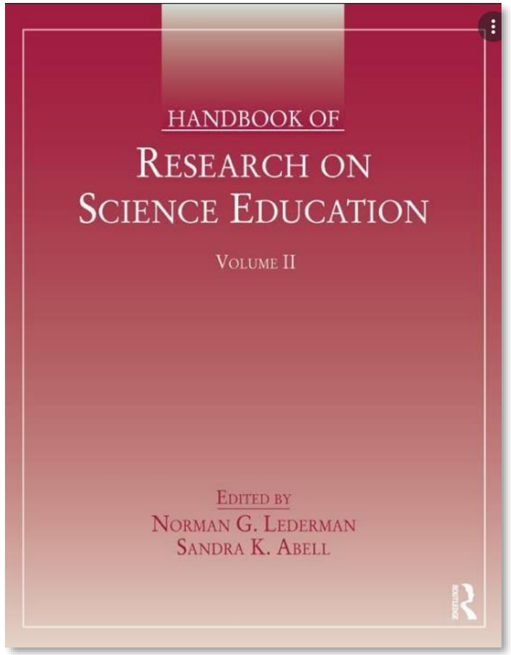
FIGURE 1.1 Ambitious Science Teaching framework

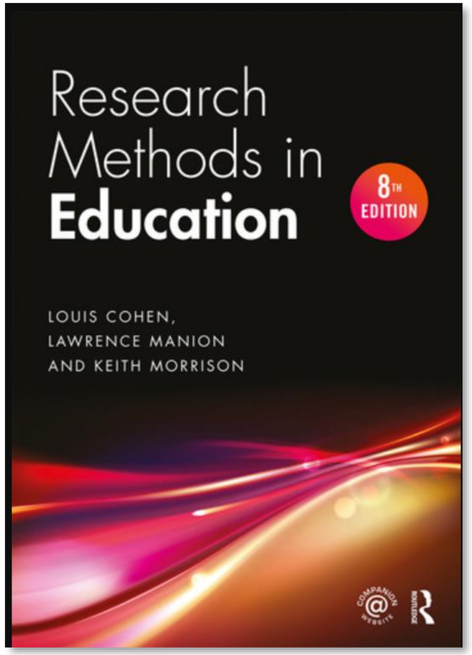
Domain 2. Science Education

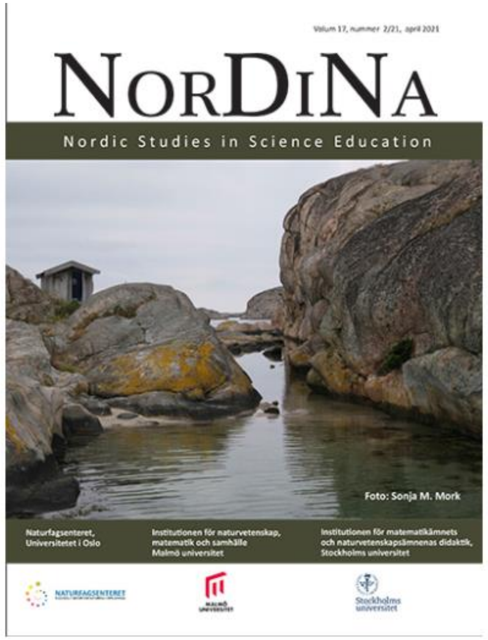
Knowledge of

a) relevant learning theories and their application to student learning in science
b) school science curriculum and aims for scientific literacy
c) instructional strategies to promote student learning
d) inquiry-based science education and science and engineering practices
e) how to use assessment purposefully to support student learning in science
f) how to promote 21st century skills in science
g) how to organize cross-curricular work and promote sustainable development and democratic and equitable participation through science education
h) how to use digital resources and computational thinking to promote science learning
i) how to explicitly model research-based teaching practices
j) pre-and in-service teachers as learners and how they develop their identity as science teachers

Domain 3. Science education research







Domain 3. Science education research

a) Knowledge of a range of educational research approaches
b) Experience with conducting science education research and disseminating findings
c) Knowledge of supervising students at the master's level
d) Experience with finding, interpreting and applying results from research in science teacher education
e) Knowledge of academic writing in the field of science education

#thatfeeling

Further reflection