An outline of the main ideas and the key recommendations from

The ASSIST-ME project

Assess Inquiry in Science, Technology and Mathematics Education

Policy conference, Brussels 16 November 2016

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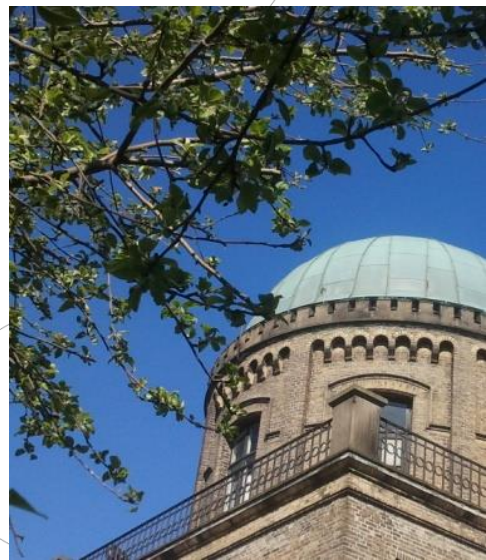


ASSISTME

http://assistme.ku.dk/

Contradictions in educational politics

Increasing demand for innovative competencies
– tight steering of all educations

Increasing demand for creativity and individuality
– increased harmonisation across countries

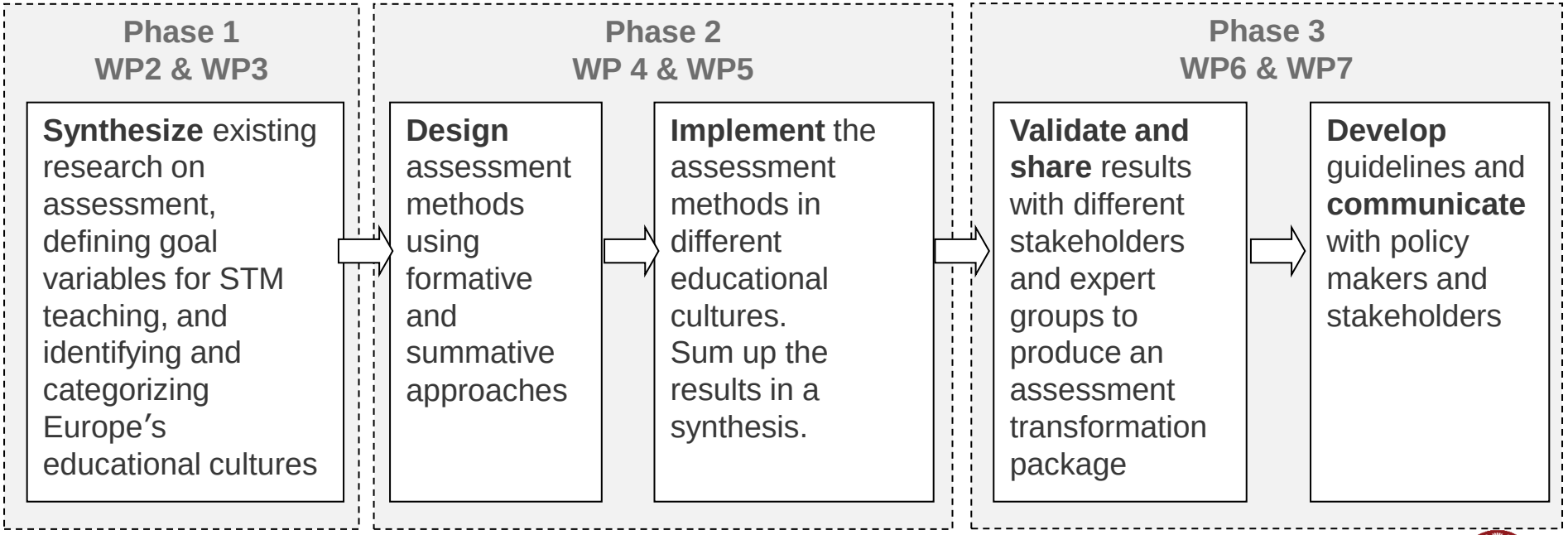
Increasing demand for advanced professional and generic competencies
– an assessment system not able to assess them

An educational discourse about learning
- an assessment culture (accountability, competing for marks etc.) distorting the learning culture, promoting a performance motivation among students at the expense of mastering.

Possible solutions:

1. Implement more valid assessment methods suitable for summative purposes
2. Increase the use of formative assessment
3. Combine the formative and summative use of assessments

The overall aim of ASSIST-ME is to **provide a research base** on effective uptake of formative and summative assessment for inquiry-based, competence oriented Science, Technology and Mathematics (STM) education in primary and secondary education in different educational contexts in Europe and to use this research base to **give policy makers and other stakeholders guidelines** for ensuring that assessment enhances learning in STM education.



Four assessment methods and six competences

In ASSIST-ME we have chosen four assessment methods:

- Interactions on-the-fly
- Written Feedback (no marking)
- Student Peer- and Self-Assessment
- Structured Assessment Dialogue

and six competences:

- Empirical investigations in **science**
- Problem solving in **mathematics**
- Design in **technology**
- Argumentation
- Modeling
- Innovation

We see the last three competences as generic, in the sense that they can be acquired in all three subjects.

The research questions

1. What are the **main challenges related to the uptake of formative assessment** in the daily practices in science, technology and mathematics in primary and secondary schools in different European educational systems?

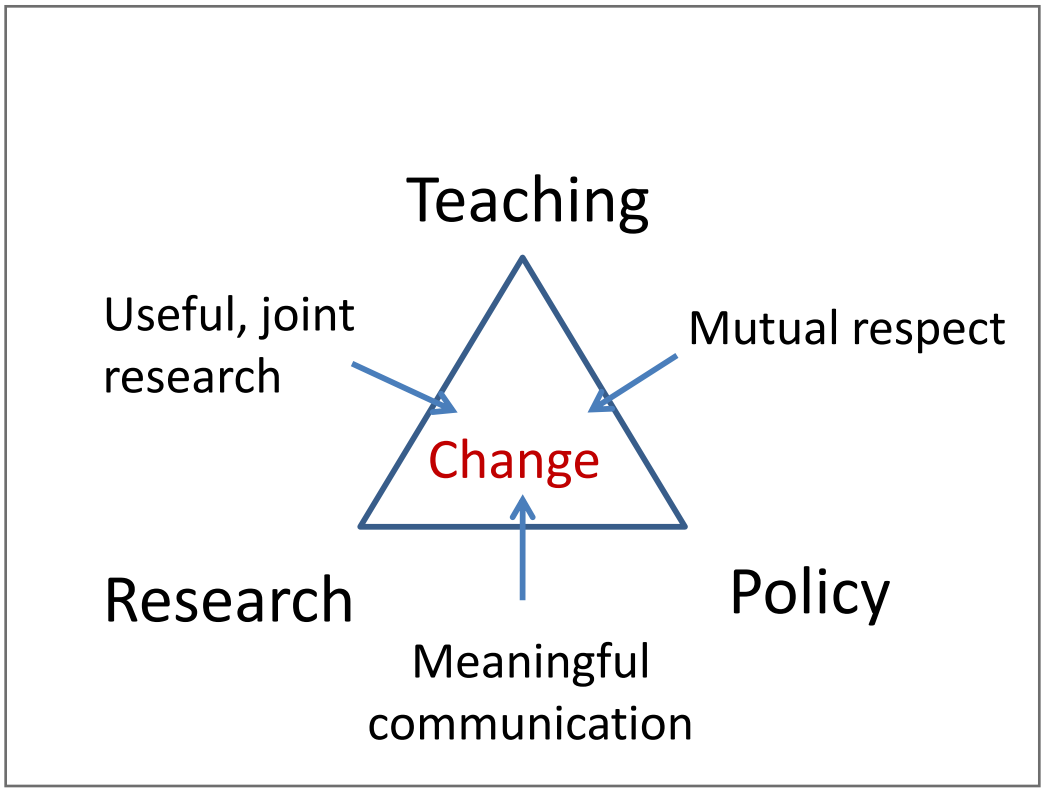
2. What **changes are needed in summative assessment** practices?

3. How can formative and summative assessment methods be **used together** to promote learning in inquiry-based STM teaching?

4. How can research-based strategies for the use of formative/summative assessment be **adapted to various European educational traditions** to ensure their use and avoid hindrances?

Stakeholder Panels and Local Working Groups

The overall goal is to change (the conditions for) practice. In order to make this possible, research and implementation take place in close collaboration between researchers, teachers and policy makers.



The collaboration is managed through
National Stakeholder Panels with representatives from industry, ministry, heads' association, teachers' association, media, Parliament, foundations etc.

and through
Local Working Groups with teachers working together with researchers in action research processes.

The worlds of research, policy and practice

(Debauvais/UNESCO 1990) mentions the 'friction between decision makers and researchers' as a key challenge and the "various difficulties of communication" between researchers and teachers

(OECD/CERI, 1995. p. 13) talks about "uneasy relationships" and a "crisis of confidence" between research and policy.

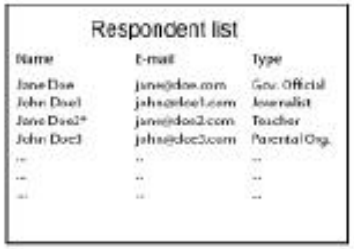
Edwards *et al.* (2007) described '*boundary zones*' as (p. 652):
"Sites for discussion, where people's own organisational priorities are recognised; where ideas can be shared, trust built and collaboration stimulated. Rather than places for one-way dissemination of research findings, they work as sites of mutual learning where knowledge flows in and out of projects, from and to the field of study."

The National Stakeholder Panels

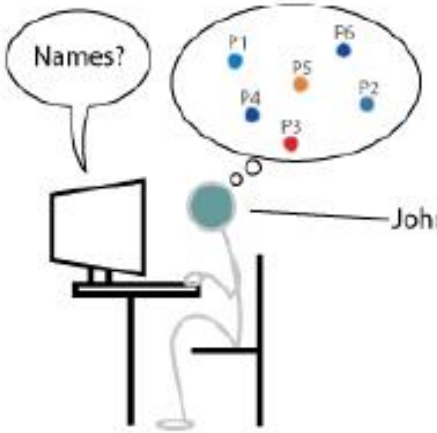
"… to transmit understanding to decision makers you need to break down the barriers between the research world and the policy world through better communication and an understandable and usable message. This can only be achieved if the two parts meet to exchange ideas and understandings and accept each other' respective capacities and influence." (DoW p. 19)

"On a national level **National Stakeholder Panels** will be established in all partner countries at the project start. University of Copenhagen will facilitate the identification of relevant stakeholders via a social network analysis method developed at the university " (DoW p. 19)

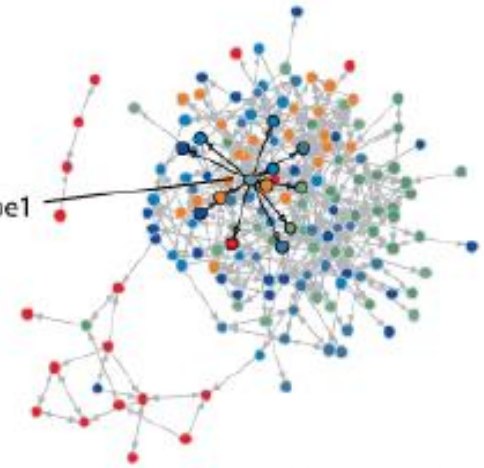
Finding key stake holders



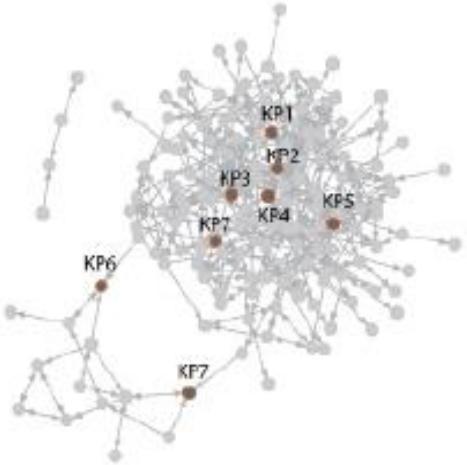
A: Make list of stakeholders



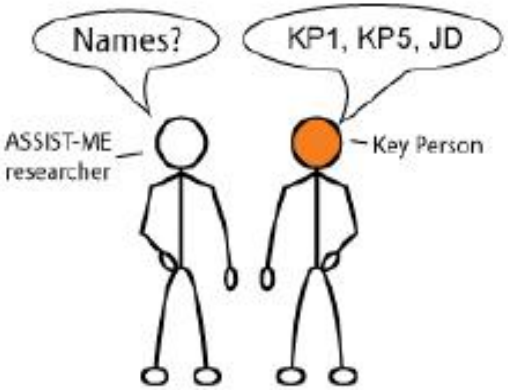
B: Send out network survey



C: Use answers to produce network



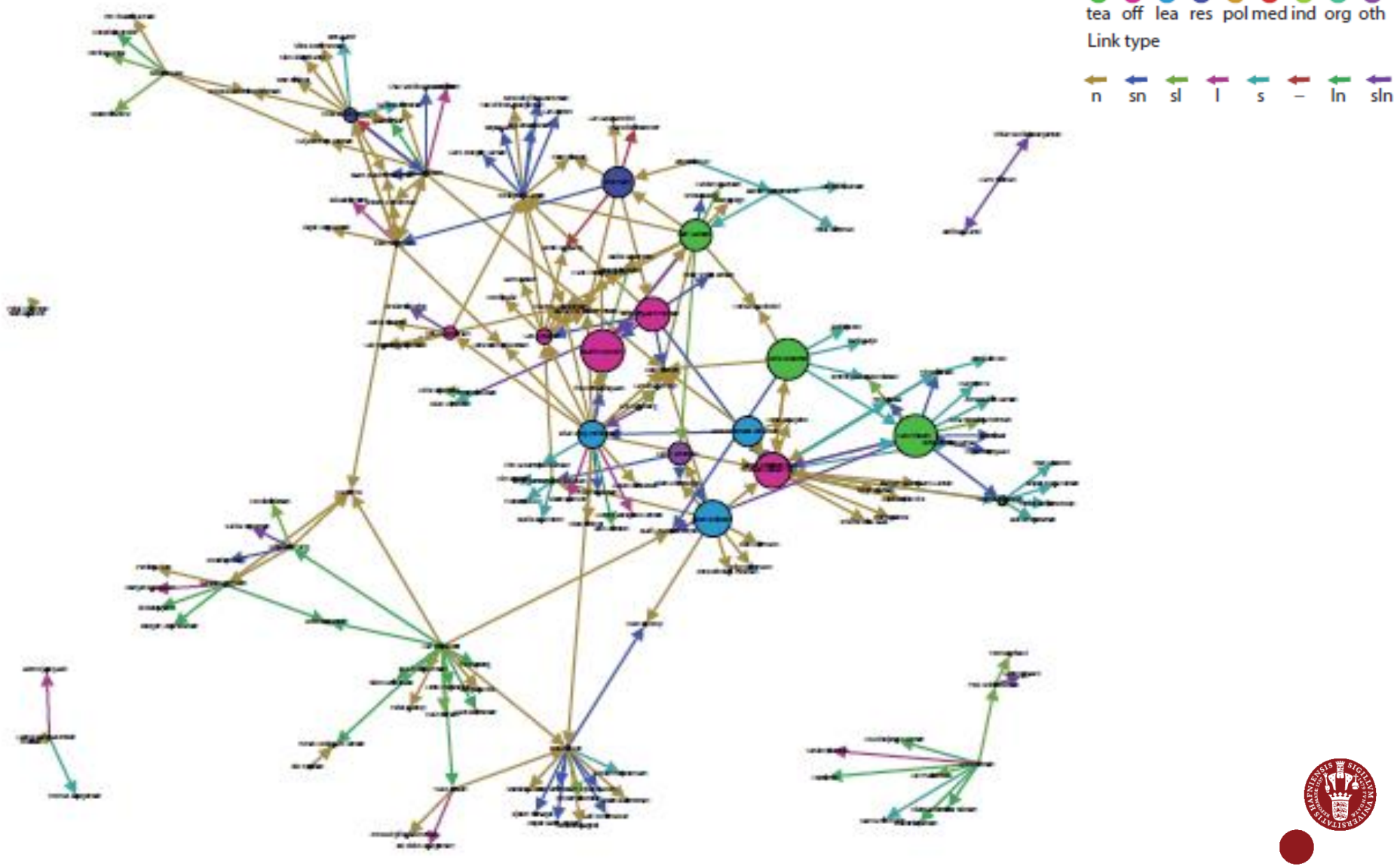
D: Select key persons for new list



E: Ask key persons for names

F: Refine network (and select NSP members)

The Danish stakeholder network



The NSPs met three times during the project following a common standard agenda reflecting the current project needs for input and guidance – supplemented with local issues.

The purpose has been twofold:

1. To establish a forum for national cooperation and awareness across different interests, a meeting place for relatively informal (formal) discussions. This process should also give the partners a possibility of recognition by and influence on national educational policy.
2. To collect data on EU level to see if it is possible to establish a European opinion on issues related to the research questions.

Excerpts from the NSP minutes

Q: Do you see any reason to change the assessment/examination culture in your country?

- it was generally agreed that consistency is important, and thus there needs to be an alignment between teaching and assessment (same criteria and visible criteria (for students)).

Q: Is it desirable to try to combine formative and summative assessment?

- There was a general understanding of the idea but also of the difficulties involved in combining the two purposes, and in Ch it was forbidden by law.
- it was mentioned in one of the panels that "that there is lack of systematic implementation of the two types of assessment. Hence, combining the two types becomes an ever more difficult task"
- In one of the panels, it was argued that the only way to combine formative and summative assessment is by evaluating student portfolios in order to monitor students' learning progress.
- for some purposes, assessment can (and should) only be formative and it is important to keep in mind that formative and summative assessment serve different functions.

Q: Is learning about formative and summative assessment an important aspect of teacher education and TPD?

- Not in all countries and there was consensus about the importance of improving teachers' assessment competence.
- There is a need for alignment between the theoretical content that pre-service teachers learn in the various phases of teacher education (i.e. what we expect them to do) and the reality they find in practice (i.e. what they are able to implement). If the discrepancy is too big, the acceptance of assessment will decrease.
- Regarding in service teachers, there is a need for teaching innovation projects that integrate teaching institutions (e.g. schools) and research collaborative groups

The deliverables

We have until now produced 44 deliverables

We have produced several journal articles

We have presented at numerous national and international conferences and seminars.

The final Assessment Transformation Package aimed at teachers and stakeholders is integrated in the website: http://assistme.ku.dk/

The Assessment Transformation Package aimed at researchers will be a book:
Transforming assessment – *through an interplay between practice, research and policy. Springer August 2017.*

11 chapters covering the project findings

ASSIST-ME overall recommendations

A competence-oriented, inquiry-based pedagogy is important

The project points at ways to implement such a competence approach in different educational cultures and recommends adjusting educational policies to make this possible.

Focus on formative assessment to support competence-based inquiry learning

It is therefore necessary to promote a teaching approach integrating formative assessment into the classroom culture and to frame the educational conditions, resources and the curriculum to make it happen.

Reduce the emphasis on summative assessment to give room to formative assessment

It is recommended to develop national assessment policies that recognise the different roles and potential involved in the interactions between formative and summative assessment and that makes it possible to realise the full potential of formative assessment processes.

Develop new examination forms able to capture STM competencies

The project points at ways to implement such a competence approach in different educational cultures and recommends adjusting educational policies to make this possible.

Teachers need support in implementing and enacting classroom assessment of STM competencies

The project has identified a strong need for professional development programs that support teacher understanding of formative assessment