

Report from the FP7 project:

# Assess Inquiry in Science, Technology and Mathematics Education

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**ASSIST**ME

## Illustrative Examples: A sample of illustrative examples of the use of formative assessment methods in inquiry-based education

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| <b>Dissemination level</b> | PU = Public  |

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## WP6.4: Suggested Illustrative Examples

'T6.4: UCPH and KCL will identify illustrative examples of outcomes from the use of formative assessment methods in IBE and create presentation formats and information packs for policy makers and teachers.' (FP7-SCIENCE-IN-SOCIETY-2012-1, 2012)

T6.4 is the first of a two-part deliverable for ASSIST-ME. It identifies seven project aspects that cover central project ideas from project partners. These seven themes will be publicized and disseminated by King's College (KCL) in collaboration with UCPH as a part of their deliverable 7.3 in short video vignettes involving illustrative situations and statements from stakeholders. The ultimate goal of 7.3 is to develop practical guidelines for implementing and using the assessment methods in different educational contexts, using expert teacher and stakeholder panels and forums from different educational systems.

The seven illustrative examples shared here have been distilled from significant outcomes reported by the eight partners of ASSIST-ME. These outcomes were the basis for the resulting illustrative examples and will be incorporated in the 7.3 video vignettes produced by KCL in collaboration with UCPH.

### Partner outcomes used as the basis for the Illustrative Examples

1. Peer feedback math vs. math - influence of the type of task (Denmark). In one case the peer feedback session became a competition, while in the other case, students collaborated to "beat the system".
2. Peer feedback math motivated students vs. math struggling students - the influence of the group of students (Czech Republic). Struggling students demanded much more guidance to make the peer feedback process flow.
3. Starting expectations of the teachers and their development through the project. (Czech Republic) Open-minded new teacher vs. teacher with set beliefs about formative assessment. Open-minded new teacher was more creative in overcoming obstacles.
4. The usefulness of national stakeholder panels seems to be heavily influenced on ground work we do to dig up relevant candidates, and also on the number of candidates. This insight is useful for later projects but also for dissemination of the methods: Start broadly - do not commit to a few select entities.
5. In Denmark there were a number of teacher generated learning progressions (LPs). They showed what teachers wanted their students to learn, but also showed that LPs are difficult to structure as a ladder. Instead

they become Instructional Learning Objectives that cover different domains.

6. Structured Assessment Dialogue (SAD). An example of what it is, how to prepare for it and how to incorporate it in teaching. After further analysis, we will also have examples of different types of SADs.
7. Comment: In general, examples for secondary teachers may need to be related to specific topics in order for them to really see the connection to their teaching practice.
8. Peer assessment: when students understand that they made a mistake while correcting the peers
9. On-The-Fly: Sequence of ESRU (France) and E-S-E-S-E-S (Finland)
10. Both peer assessment and On-the-Fly : Teachers' interviews on how the uptake of formative assessment.
11. Teachers recognizing what formative assessment means; complexity, facets, time affordance, ... (situation occurred when teachers judged students' artefacts and discussed the learning goal)
12. Teachers recognizing how difficult it is to reach a sufficient reliability
13. Teachers valuing information about individual students; usually students work in groups especially when realizing some kind of inquiry
14. Narrative from teachers about how it is to teach inquiry and assess competences (in general)
15. SAD described from the perspective of a researcher, teacher and a student
16. Problems/benefits for teachers when formulating Learning Progressions; researcher explains that we may need better metaphors for inquiry learning
17. How can the leadership at a school facilitate high quality FA practice? – e.g. a school leader and/or a teacher and/or a researcher
18. Teacher perspective on exams -> hindrance of the uptake of inquiry teaching
19. Student perspective on e.g. peer assessment, self-assessment.
20. Adaption / transfer of assessment strategy to different teaching units
21. Making learning goals explicit
22. Usability of peer-feedback: differences between students
23. Teacher who did not implement the assessment dialogue because of the social structure of his class
24. Teachers talking about the assessment dialogue
  - a. Effects in classroom
  - b. Effects in groups of teachers
25. Collaboration between teachers in order to develop rubrics, learning progressions, ...

26. Advantages and challenges of written feedback in the chicken example: the students got better in the assessed competence but providing the feedback took a lot of time (integrated sciences; primary level)
27. Teacher integrating peer-assessment in his regular teaching practice because of the benefits (Physics, upper secondary level)
28. Failed examples; e.g. “too big” and ambitious to be handled; lack of time (various examples)
29. School heads’ perspective on advantages and affordances of formative assessment

Based on these 29 partner outcomes, seven themes have been developed as the basis of the video vignettes of 7.3. Table 1 summarises these themes.

### Seven project aspects that cover central ideas from partners

Table 1: Summaries of seven examples from the project which have been distilled from the experiences, data and analyses of the eight partners. ‘Themes’ are identified by brief ‘abstracts’ and the sources from which they are drawn are listed in ‘Transnational Experiences’. ‘Key notes’ provide the focal points of the video vignettes, based on the collaborative outcomes of the project.

| <b>Seven Themes</b>                                   | <b>Abstract</b>   | <b>Transnational Experiences</b> | <b>Key notes: focal points for the video vignettes</b>  |
|---|---|----------------------------------|---|
| <b>Using peers as a source for feedback in IBSTME</b> | Narrative of one teacher and one researcher. Exemplifying structured feedback (students give feedback using a template/tool). Reflecting on benefits and challenges. Communicating the transnational experiences. | Drawn from WP5                   | Need for pupil training to give useful peer-to-peer<br><br>Usability of feedback between pupils with different abilities<br><br>Problem with students valuing of peer |

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|  |  |   | <p>compared to teacher feedback</p> <p>Existing pupil social structures interacting with peer feedback</p> <p>Handling incorrect peer-to-peer feedback</p> <p>School summative assessment in alignment with inquiry learning</p> <p>Importance of explicit and well communicated learning goals</p> |
| <p><b>Providing on-the-fly feedback in the inquiry classroom</b></p> | <p>Narrative example of one teacher and one researcher. Exemplifying on-the-fly feedback. Reflecting on the benefits and challenges. Communicating the trans-national experiences.</p> | <p>Drawn from WP5</p> <p>Teacher and Researcher from Czech Republic</p> | <p>Difficulty in following ESRU sequences</p> <p>Advantages of deep experience in providing on-the-fly feedback</p> <p>Teacher understanding of inquiry learning is essential for on-the-fly</p>  |

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|  |   |  | <p>feedback to promote inquiry</p> <p>School summative assessment in alignment with inquiry learning</p> <p>When progressive inquiry competences are involved, understanding those is essential for on-the-fly</p> <p>Importance of explicit and well communicated learning goals</p> |
| <p><b>Written feedback as formative assessment in IBSTME</b></p> | <p>Narrative example of one teacher and one researcher. Exemplifying different formats of written feedback. Reflecting on benefits and challenges. Communicating the transnational experiences.</p> | <p>Drawn from WP5</p> <p>Teacher and Researcher from Switzerland</p> | <p>The amount of additional teacher's time needed for written formative assessment ... strategies for dealing with the time issue</p> <p>Adjudicating between the challenge of good written feedback and good enough</p>  |

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|   |  |  | <p>to facilitate inquiry</p> <p>School summative assessment in alignment with inquiry learning</p> <p>Use of IT and structured environments for providing written feedback</p> <p>Importance of explicit and well communicated learning goals</p>        |
| <p><b>Assessment dialogues as a way to combine formative and summative assessment</b></p> | <p>Narrative example of one teacher, one researcher and one student. Exemplifying the format. Reflecting on benefits and challenges. Communicating the trans-national experiences.</p> | <p>Drawn from WP5</p> <p>Teacher and Researcher from Denmark</p> <p>Graphics</p> | <p>Overcoming classroom social structure impediments to assessment dialogues</p> <p>Multiple variables in using assessment dialogues ... classroom dynamics, student variance, teacher skills, trust and maturity issues</p> <p>School summative as-</p> |



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|  |  |   | <p>assessment in alignment with inquiry learning</p> <p>Excellent example of assessment dialogue with commentary</p> <p>Importance of explicit and well communicated learning goals</p>   |
| <b>A network driven effort to influence educational policy</b> | Narrative of one researcher and up to two National Stakeholder Panel (NSP) members.. Explaining how the project has sought to influence policy makers. | <p>Drawn from WP6</p> <p>Graphics</p> <p>Researcher from UCPH and two NSP members from other partners</p> | <p>Concrete examples of the use of network analysis to help create messages able to influence educational policy</p> <p>Drawing strategies for influence based on network connections and concordance</p> <p>Intentional inclusion of diversity in the NSP members used for the vignettes</p> |
| <b>Teacher driven development of learn-</b>                    | Narrative of one teacher and one researcher. Exemplifying teacher driven   | Drawn from WP5  | Clarifying what learning progressions are   |

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| <p><b>ing progressions</b></p>   | <p>development of learning progressions. Reflecting on benefits and challenges.</p>   | <p>Graphics<br/>Teacher and Researcher from Denmark</p> | <p>and facilitating local teacher developed learning progressions for all major content objectives</p> <p>Importance of explicit and well communicated learning goals</p>   |
| <p><b>Professional development when working with inquiry- and competence oriented teaching</b></p> | <p>Narrative of up to two teachers and one researcher. Reflecting on own and collaborative professional development. Reflecting on what is new to teachers and the challenges involved.</p> | <p>Drawn from WP5<br/>Graphics</p>                      | <p>Attitude and support of administrators for using formative assessment both with and without summative assessment</p> <p>Deep understanding of the nature of inquiry teaching and learning is essential if formative feedback is to be useful</p> <p>School summative assessment in alignment with inquiry learning</p> <p>Working with new teachers who have not</p> |

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|  |  |  | fully codified their teaching methods may be useful in systemic change |
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## Summary

T6.4 is the first of a two-part deliverable for ASSIST-ME. It identifies seven project aspects that cover central project ideas from project partners. These seven themes will be publicized and disseminated in various formats and designs by King's College (KCL) in collaboration with UCPH as a part of deliverable 7.3. These materials will contribute to the ultimate goal of 7.3, which is to develop practical guidelines for implementing and using the assessment methods in different educational contexts, using expert teacher and stakeholder panels and forums from different educational systems.

The seven illustrative examples shared here have been distilled from significant outcomes reported by the eight partners of ASSIST-ME. These outcomes were the basis for the resulting illustrative examples and will be incorporated in the 7.3 dissemination materials produced by KCL in collaboration with UCPH.

## References

FP7-SCIENCE-IN-SOCIETY-2012-1 (2012). Annex I - Description of Work: *Research on the use and development of formative and summative assessment methodologies in mathematics, science and technology in primary and secondary education*. EU