More than right or wrong!

Digital tools for formative self- and peer assessment in science and mathematics education

FaSMEd

UNIVERSITÄT DUISBURG ESSEN

Open-Minded

Science:

Scientific Goal

Students solve a problem by **planning, performing and documenting an experiment.**

Who has the juiciest apple?

Effects of the surface-to-volume ratio on the evaporation of liquids

Sweet or sour – Our teeth like neither!

Acid-protective effect of toothpaste

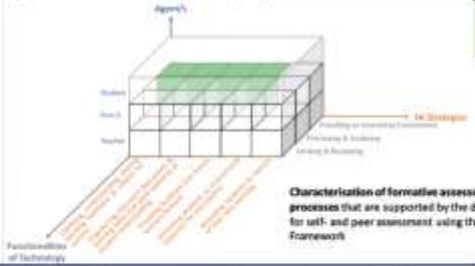
Tool Design

The tool (interactive presentation) helps students to assess how well they can follow experimental steps:

- propose a hypothesis,
- consider various experimental approaches,
- plan an experiment,
- observe,
- evaluate the results,
- draw a conclusion on hypothesis,
- draw a diagram

Assessment cards/slides

"Good to know" and Definition cards/slides



Characterisation of formative assessment processes that are supported by the digital tool for self- and peer assessment using the FaSMEd Framework

Mathematics:

Aim

Develop a **digital tool that allows students to become assessors:**

- active involvement of students is key aspect of formative assessment,
- Investigating their (mis-)conceptions helps students to:
  - gain sensitivity for their strengths and weaknesses,
  - use metacognitive strategies,
  - adopt responsibility for their own learning process.

(Black & Wiliam 2009, Wiliam & Thompson 2007, Heritage 2007)

Content: The concept of functions

Transformation of representations: ***Can I sketch a graph based on a given situation?***

Mental mathematical representations of functions:

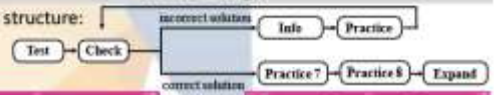
mapping	covariation	object
The function maps one value of the independent quantity to exactly one value of the dependent quantity.	The function describes the change of two quantities with each other.	The function as a whole describes a new object.

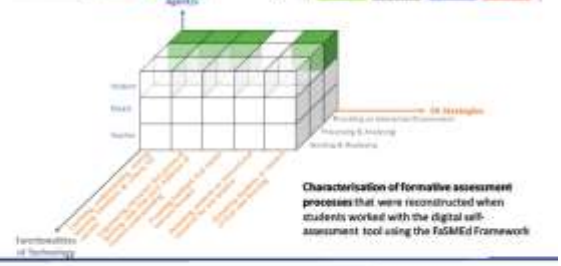
Typical misconceptions: graph-as-a-picture, swap axes, ...

(Duval 2002, Vollrath 1989)

Tool Design

Hyperlink structure:





Characterisation of formative assessment processes that were reconstructed when students worked with the digital self-assessment tool using the FaSMEd Framework

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References

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