Deliverable D3.1 Prototype toolkit: A prototype toolkit for teachers to support their use of formative assessment in the classroom including advice and support in using technology

The FaSMEd toolkit consists of all the materials developed in the project and is being published as a public FaSMEd-website (http://toolkitfasmed.wordpress.com/ for the prototype). The target group of this international website are mainly teachers, but also teacher trainers and other interested parties in the partner countries and beyond. The website is presented in English but information in French, Italian, Dutch, Norwegian and German will be provided by the end of the project as well.

The toolkit is composed of five sections including guidance on how to use the toolkit and information on each of the FaSMEd partners; a theoretical background on formative assessment and the use of technology; classroom activities for mathematics and science teachers; materials for teacher professional development; and finally the projects' research findings as well as the cross-country analysis.

This toolkit structure is described more closely in the following and includes screen shots from the toolkit:

The FaSMEd Toolkit

1. HOME

In this first section of the toolkit the FaSMEd project is introduced. It explains that the project is about formative assessment and about researching ways in which technology can support formative assessment. The aims and objectives are also included.

This section has links to the following two subsections:

1.1 Using the toolkit

This section of the toolkit provides guidance on how to use the website. It explains the ways of working with the FaSMEd materials more closely to the toolkit-users, namely teachers and teacher trainers. Furthermore, it stresses that the materials are not organized in a linear way but can be used partly and in any order according to the teachers' needs.

1.2 Partners

This section of the toolkit is dedicated to introducing the FaSMEd partners and their work in the project. This includes information about the staff working in FaSMEd as well as their roles in the work packages and their contact details. Later on, teachers who are involved may be added.

2. THEORY

The second section of the toolkit provides information about formative assessment and the ways in which technology can be used to support it as well as an outline of principles for effective professional development. This section provides a theoretical background for the toolkit-users, and also communicates the "message" and main ideas of the FaSMEd project.

2.1 Formative assessment

First formative assessment (or assessment for learning) is defined and set in contrast to summative assessment (see deliverable D1.2 Glossary for further information). It is stressed that not only the collection of evidence about student achievements is of importance but that it is the selection, interpretation and use of this information that makes an assessment formative. Formative assessment is mainly driven by individual feedback and loops of further development and adjustments. Furthermore, it is described that formative assessment has a wide range of possibilities to raise students' attainment levels and support especially lower achievers. The toolkit-user learns that formative assessment can be part of any phase in teaching, for example the introduction, systematisation, small group working, practice or repetition of contents. What is more, formative assessment should always be focused on the particular content discussed in the classroom.

2.2 Technology

This section describes the used technologies and how these different technologies can support formative assessment. Since the use of technology to enhance formative assessment is seen as a central theme of the FaSMEd project, it is integrated in every section of the toolkit.

In order to develop effective systems for formative assessment supporting adaptive and/or differentiated instruction, teachers need diagnostically useful and actionable information, not only classification data such as numeric test scores (Foshayla et al., 2012).

The different ways in which technology could support formative assessment include (amongst others):

(a) it enables the collection of resources, by offering online databases that link curriculum, district, state, and national standards;

(b) it can make available to teachers pools of assessment tasks and items that can be embedded within lessons and units;

(c) it enables the assessment of those aspects of cognition and performance that are complex and dynamic, through technology-based systems characterised by rich, complex, authentic contexts; interactive, dynamic responses; individualised feedback and coaching; diagnostic progress reporting.

A detailed position paper on this topic has been produced by the consortium.

2.3 Professional Development

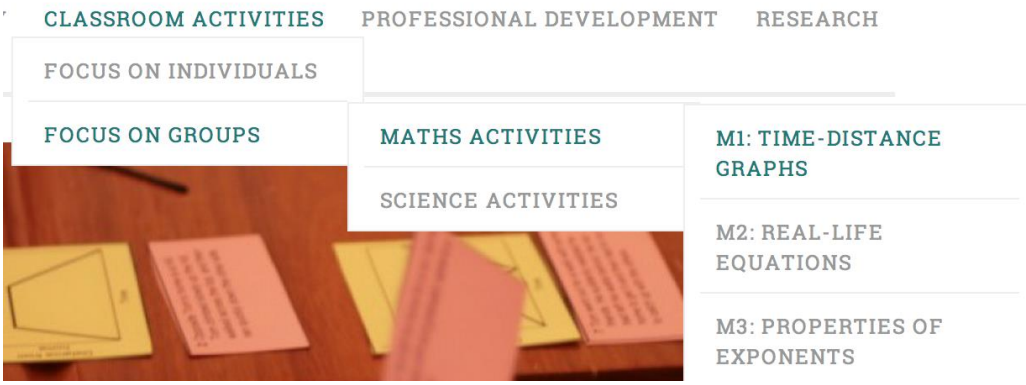
This section is taken from D3.4 and includes the following principles:

- Transparent competence goals
- Focus on content
- Connecting theory and practice
- Case orientation
- Cooperation
- (Self-) reflection
- Considering teachers needs

3. CLASSROOM ACTIVITIES

The third section of the toolkit consists of all the materials produced by the FaSMEd partners to assist technology supported formative assessment in the classroom. They are meant to be examples of how to integrate formative assessment in mathematics and/or science lessons.

The FaSMEd-website provides a variety of materials concerning different subjects, grades and topics. Each one contains at least one classroom activity as well as a guide to advise teachers about its use. To simplify the search for certain contents or activities, the materials are tagged. Furthermore, the examples are categorized in sub-sections: classroom activities that focus on groups of students and are designed for different phases of teaching as well as materials for individual student learning that are used more occasionally in the classroom.



All example materials share a common format to ensure an easy handling of the toolkit: At first general information about the classroom activities are provided. This includes for example the content, grade or age of the students, the goals, references to national

educational standards, required materials, needed time or the relevance for different phases of teaching. A lesson plan follows, which informs the teacher on how to use the materials in the classroom. The lesson plan can include several different alternatives so that the examples can be employed flexibly according to the needs of the learners. Furthermore, the teachers are provided with guidance for teaching the lesson including common issues that students might face when working on an activity and provided with suggested questions and prompts to face their students' issues. Finally, they are given guidance on how technology can support formative assessment and what role technology can play in their students' learning processes in the given example.

The structure of the classroom material can be summarized as followed:

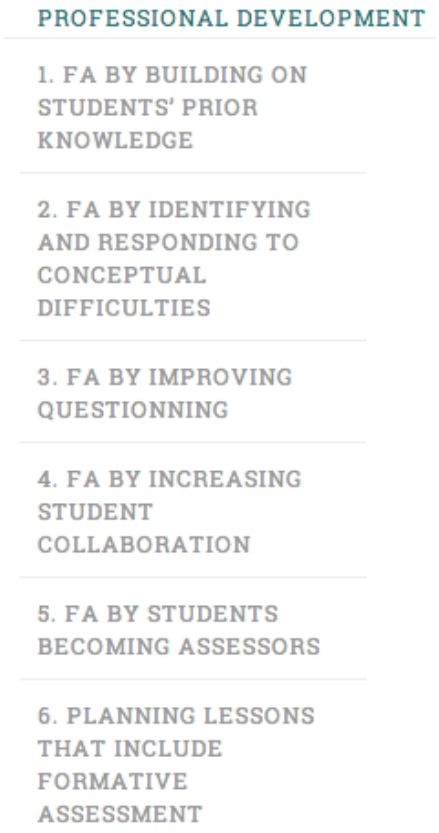
3.1 Formative Assessment - focus on groups:

- Title of the example and general information
  - *Lesson plan*
  - *Guidance (which includes common issues together with suggested questions and prompts)*
  - *Role of technology*

3.2 Formative Assessment - focus on individuals:

- Title of the example and general information
  - *Lesson plan*
  - *Guidance (which includes common issues together with suggested questions and prompts)*
  - *Role of technology*

4. PROFESSIONAL DEVELOPMENT



The fourth section of the FaSMEd Toolkit contains information to acquaint teachers and teacher trainers with formative assessment on a more general level than a single classroom material. The provided materials aim to support the teachers not only in using the examples of classroom activities presented in the previous section of the toolkit but also in planning their own activities and using formative assessment effectively in their own lessons.

The professional development materials are presented in the form of modules, which explore some of the pedagogical challenges associated with using formative assessment effectively in the classroom. They are intended to be used by groups of teachers or as part of a teacher training (see deliverable D3.4 Prototype professional development package for teachers for further information) as the discussion and interaction with others is an important part of the developing process. However, the materials are adaptable to different situations and may also be helpful as a self-training. The following modules are included in the toolkit:

4.1 FA by building on students' prior knowledge

4.2 FA by identifying and responding to conceptual difficulties

4.3 FA by improving questioning

4.4 FA by increasing student collaboration

4.5 FA by enhancing students to become assessors

4.6 Planning lessons that include FA in different phases of teaching

5. RESEARCH

RESEARCH

CASE STUDIES

CROSS-COUNTRY ANALYSIS

The final toolkit will include *case studies* from all partners, the central findings of the *cross-country analysis* and research done in each participating country as well as interesting examples of data to support and explain these findings. The aim is to communicate and inform teachers about the research done within FaSMEd.

As the results of the research and the cross-country analysis are yet to be produced, this section of the final toolkit will not be included in the prototype toolkit.

References

Foshayla, W.R., and Bellman, A. (2012). A Developmental Model for Adaptive and Differentiated Instruction Using Classroom Networking Technology. *2nd International Conference on Future Computers in Education. Lecture Notes in Information Technology*, Vols. 23-24 (pp.90-95)