



FAMT&L

FORMATIVE ASSESSMENT IN MATHEMATICS FOR TEACHING AND LEARNING

*Work Package 4 - Planning and implementing pilot
training courses*

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<p>The training model would foster a proper use of formative assessment (assessment for learning) in mathematics education in such a way that can be used in various school environments and age groups, encouraging teachers' reflective and critical thinking about effective/ineffective teaching and assessment strategies. It will include also the develop of training methodological patterns (or schema) in order to model at least five training paths or to give some methodological criteria to build on other training paths.</p> <p>The training model will be used to define training paths organised through blended learning and face-to-face lessons, according to learning needs and resources (including those reporter in the web-repository).</p>			

Executive summary

This document is a report including the description of a training model for middle school math teachers (that can be applied to in-service and pre-service training) with the purpose to improve teachers' competences on educational planning and assessment (both formative and summative assessment; assessment for learning) and on mathematics didactics.

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1. Introduction

The WP4 aims to:

- ensure that the pilots is realized in time;
- coordinate the various partners to the definition of pilot training courses on formative assessment for mathematics' teachers;
- ensure that each partner implements the pilot training courses;
- identification of significant cases of study.

At present. At present we have respected the timetable and we have defined two training models to discuss with colleagues in the next meeting to take place in Cyprus; the first is a distance training model and the second is a mix distance/face-to-face model. In this phase we are coordinating different points of view and needs to define a training model that meet the requirements of each country.

In particular, to achieve the expected aims the work package will include the following tasks:

T4.1 Planning meeting

WP4 will start with a meeting involving Universities and Schools at the end of WP2 and WP3. The aim of this meeting is to discuss with researchers, teachers and students some findings coming from WP2 and WP3 analysis.

At present. We have already held this meeting that helped to identify some aspects that will be used in the training model.

T4.2 Identification of significant cases to include in the web repository.

Identification of significant cases that reflect the pattern of training that will be collected and uploaded in the web repository (WP5). Tools and videos stored in the repository will be used as methodological resource for planning teacher-training paths.

At present: At the moment important cases, that reflect training model, have been identified. Now, each partner is making several videos that will be uploaded on the platform and then they will used in the training model.

T4.3 Identification of a training common model

Develop of training model patterns (or schema) in order to design training paths (at least 5 paths in response to the different learning needs of teachers), providing methodological criteria to build on other training paths.

Each training path shall be organized through blended learning and face-to-face lessons, according to learning needs and resources (including those reported in the web-repository).

Every training path will be implemented and tested in different (but fixed) conditions with different groups of teachers, in order to identify some criteria concerning their effective exportability on other contexts.

In particular, we expect to test these training paths with groups of teachers that are homogeneous with respect to their formative needs. For example, we will take into account teachers, which have long lasting experience versus new in-service teachers, or teachers that have deep pedagogical-didactic previous competence versus teachers that have deep mathematic previous competence.

At present: To date two general training models have been defined, the first is a mix distance/face-to-face model and the second is a only distance training model (see paragraph 4 and 5). At the moment the two training models are under discussion between the countries.

T4.4 Implementing of ground pilot training courses in schools

This phase foreseen in the project will be made later.

Aims to training courses

- The aim of these teacher-training paths will be to foster a proper use of formative assessment (assessment *for* learning) in mathematics education among teachers.
- Identification of significant cases related to different aspects of the formative assessment that reflect the pattern of training that will be collected and uploaded in the web repository (WP5).

2. Planning

WP4, designed in close collaboration with the other WP, has a duration of 18 months, from March 2015 until the thirty-second month.

This WP consists of:

- D4.1 Training model of the duration of the entire WP4 (18 months):

The training model would foster a proper use of formative assessment (assessment for learning) in mathematics education in such a way that can be used in various school environments and age groups, encouraging teachers' reflective and critical thinking about effective/ineffective teaching and assessment strategies. It will include also the develop of training methodological patterns (or schema) in order to model at least five training paths or to give some methodological criteria to build on other training paths.

The training model will be used to define training paths organized through blended learning and face-to-face lessons, according to learning needs and resources (including those reported in the web-repository).

- D4.2 Implementing of ground pilot training courses in schools, from May 2015 to June 2016, at present in a structuring phase.

- D4.3 Guidelines for mathematical teacher training on the promotion and proper use of formative assessment in mathematics to achieve in future (June 2016).

3. Theoretical framework

Theoretical framework useful for the construction of the training model has been made from the theoretical framework of the project (shared by countries) and others references. The main purpose has been to track the most important elements that have repercussions on training.

We started from the premise that many researchers stress that assessment must be formed “for” learning and not “of” learning, as it is generally acknowledged that increased use of formative assessment (or assessment for learning) leads to higher quality learning (William, Lee, Harrison & Black, 2004). In this sense, Nicol and Macfarlane-Dick (2004) argued that formative assessment should be an integral part of teaching and learning in higher education, so it must be handled competently by teachers. We agree with the aforementioned opinion, emphasizing that the use of formative assessment in teaching can have many benefits on one hand on improving the students’ mathematical learning but also the development of positive beliefs towards the learning of mathematics, and on the other hand in helping the teachers in doing proper adjustments according to their students’ needs. Formative assessment develops fully autonomous learners, who can self-assess their work, make meaningful inferences from it and plan the next steps for further progress (Black and William, 1998). Formative assessment also provides information to teachers about students’ difficulties and where to focus their teaching efforts. In the same sense, for Nicol and Macfarlane-Dick (2004) formative assessment, besides providing a framework for sharing educational objectives with students and for charting their progress, it can also generate feedback that can be used by students to enhance learning and achievement and by teachers for adjusting their teaching practices in order to correspond to their students’ needs.

3.1 Training model

The pilot training will be insert in the perspective to the collaborative approach between researchers and teachers (Morissette & Desgané, 2009). This approach has many developed using a combination of sight between two worlds sometimes difficult to reconcile: that of the researcher and that of teachers. This approach takes into account a perspective of collaboration between teachers and researchers to build together knowledge. Teachers are recognized as competent actors that have the resources to act, to reflect on this actions and to theorize about their practices.

There are some several researches on the formative assessment which were conducted on this way, for example Morrissette (2009), were the expertise implemented by primary school teachers in formative assessment was documented, starting from their explanation’s practices.

In several steps of the training model we try to build a collaborative approach between with trainers (researchers) and teachers. For example where we plan and analyze the practices about formative assessment.

We will consider also a perspective of training - research that goes in the direction of the model focused on the analysis, making the teachers able to devise their own responses to solve the problems (Zay, 1983). This model refers to the centration of the analysis in procedures such as autoscopia, hétéroscopia, micro teaching and other simulations. This model use the videos as a part of training, above the analyses of videos to improve the practices of formative assessment.

3.2 Teachers' beliefs

We will base the training on the change of teachers' beliefs. We will consider the "change of beliefs" in the sense of "development-modification of beliefs in the passage of time" (Wilson, Cooney, 2002). In this sense, a good analysis of teachers is that provided in Chapman (2002).

As it comes from the literature, there are various opinions concerning the notion of "beliefs". According to Goldin (1999), a belief may be "the multiply encoded cognitive configuration to which the holder attributes a high value, including associated warrants". Cooney (1999), asserts that a belief is "a cluster of dispositions to do various things under various circumstances", which leads to the acceptance that "different circumstances may evoke different clusters of beliefs" (Presmeg 1988). It is widely accepted that beliefs are the individual's personal cognitions, theories and conceptions that one forms for subjective reasons. Their nature is partly logical and partly emotional. According to McLeod (1992) "beliefs are largely cognitive in nature and are developed over a long period of time". In addition, "beliefs are a multifaceted construct, which can be described as one's subjective understandings, premises, or propositions about the world" (Philipp, 2007, p. 259). Beliefs are the meanings connected to psychological objects or phenomena and are an environmentally contingent and culturally defined lens through which sense is made of events, people, and interactions (Pratt, 1992; Ekeblad & Bond, 1994).

We will consider that: "changing a particular belief implies a re-structuring of the whole network of one's belief system, a feeling that might cause anxiety and emotional pain" (Rokeach, 1968), "changing beliefs causes feelings of discomfort, disbelief, distrust, and frustration" (Anderson & Piazza, 1996, p. 53).

To address the varying terminology about knowledge, beliefs, belief systems, and belief clusters more efficiently, Thompson (1992) invoked conceptions "as a more general mental structure, encompassing beliefs, meanings, concepts, propositions, rules, mental images, preferences, and the like" (p. 130).

A "conception" is a mental construction or representation of reality (Kelly, 1991), communicated in language or metaphors (Lakoff & Johnson, 2003) and which explains complex and difficult categories of experience (White, 1994) such as assessment. Furthermore, conceptions represent different categories of ideas held by teachers behind their descriptions of how educational things are experienced (Pratt, 1992). Thus, conceptions act as a framework through which a teacher views, interprets and interacts with the teaching environment (Marton, 1981).

"Conceptions" is the term used to describe the organizing framework by which an individual understands, responds to, and interacts with a phenomenon. The structure of teachers' conceptions is not uniform and simple; they appear to be multifaceted and interconnected. (Brown, 2004)

Specifically, in the training model we will focus the attention on the teachers' beliefs about the use of particular techniques and practices for implementing formative assessment and about factors that influence their choice of particular techniques and practices. Kyriakides and Campbell (1999) examined primary teachers' opinions about the appropriateness of particular techniques of assessment in mathematics. Performance test and structured observation were considered to be the most appropriate methods. On the other hand, unstructured observation and oral question-and-answer were seen to be the least appropriate techniques. Teachers were also asked to express the degree of difficulty of these techniques. The results indicated that unstructured observation was considered to be the easiest technique and oral question-and-answer as the next most easy. In an

effort to shed some light to this contradiction, statements examining the teachers' beliefs about the appropriateness of the use of the aforementioned assessment practices were included in our questionnaire which in part will be taken at the beginning of the training.

We will put the training in a large frame of reference related to the change of conviction that occurs in a group setting, in order to reach an urge to change the belief and judgment of what counts as valid assessment and the development of an "assessment for learning" culture through professional development and training.

The training is based on an exchange of collective beliefs. From this point of view the transition from a personal conviction to a conception shared is of utmost importance in the process of formation, given that beliefs are influenced by complex interactions within social groups. Indeed, it is not possible to separate the analysis of individual beliefs from the analysis of the beliefs of the group to which it belongs (Hoyles, 1992; Bagni, D'Amore, 2005; D'Amore, 2005), we must also consider the micro-social aspect, very important in setting the training.

What is highlighted in the group formed by students, here is transferred to the group formed by teachers. On the other hand, that there are tight similarities between the behavior of these two different types of social groups, has already been widely highlighted by research literature (see, for example: Shifter, 1990, 1993; Chapman, 1996; Jaworski, Wood, Dawson, 1999; Adler, 2001; Wood, 2001; McClain, 2003a, b). A recent work on this issue, at least with regard to the PME community (Psychology of Mathematics Education), is located in Llinares, Kraimer (2006).

During training, it is important that the teacher discovers to be some cognitive dissonance with their colleagues against whom he has appreciation and esteem. So as revealed Leo Festinger (1957-1973), the dissonance causes a discomfort that pushes the individual in question to seek harmony with their fellow humans (e.g., those belonging to their own group).

For the structuring of the training model we rely on the collection of ideas and opinions, on the change of conceptions, on a collaborative approach, differentiation according to the needs of teachers. Therefore we tried to adopt towards teachers some strong points of the formative assessment that at the end will be transferred to the students.

3.3 Tools of formative assessment

The aims of the pilot training is to improve the practices about formative assessment in the teaching of mathematics. Phases and features about formative assessment are already explained in the framework in derivable 2. To the training pilot we will choose some specific papers and documents which will be the references. We will put some examples about tools to practice formative assessment and during the training pilot, through the practices of participants we can improve the materials and tools about formative assessment.

In literature you can find several studies on the experiences of teachers compared to perspectives training to correct or evaluate student work (Groupe EVA, 1991; Veslin & Veslin, 1992) and on the development of students' active participation in the evaluation (Doyon & Juneau, 1991). In designing the training course we propose therefore to use existing instruments, for example materials proposed by Allal (1991), in the training for the teachers.

In Canada, action-research projects were undertaken to develop formative assessment instruments in a constructivist and interactionist perspective for mathematics (Thouin, 1993) and for science instruction (Thouin, 1995). Instruments of various types were developed with teachers, tried out in their classes and shared with other practitioners.

Formative assessment is tightly linked with instructional practices. Teachers need to consider how their classroom activities, assignments, and tests supports learning aims and allow students to communicate what they know, then use this information to improve teaching and learning. Two practitioner-oriented books that offer many helpful ideas about, and examples of, classroom assessments are : A Practical Guide to Alternative Assessment (Herman, Aschbacher, & Winters, 1992) and Classroom Assessment Techniques: A Handbook for College Teachers (Angelo & Cross, 1993).

The Northwest Regional Educational Laboratory has put large sections of its helpful training kit, Improving Classroom Assessment: A Toolkit for Professional Developers online. The readings, overheads, exercises, and handouts could help groups of teachers think through assessment issues in their schools. The Assessment Training Institute provides some free newsletter and journal articles about classroom assessment on its Web site¹ as well as publications, videos, and training sessions for a fee.

The National Research Council (2001) has produced a useful, accessible book on classroom assessment in science that contains many interesting vignettes about how teachers can adjust their teaching based on their observations, questioning, and analysis of student work. While the anecdotes are specific to K-12 science teaching, the chapters about the documented value of formative assessment on classroom achievement, as well as what it requires in terms of teacher development and how classroom assessment relates to summative assessment such as state tests, have broad applicability.

3.4 Techniques of formative assessment

In the structuring of the training model were held in consideration the theoretical references in the document *Information collected from the literature, projects, studies, conference proceedings deliverable* relative to D2.2: *Analysis report*. In particular we take into consideration the references relating to the different techniques of formative assessment and the effective use of formative assessment results. Some of the most important techniques in the training course will be proposed within the course (the use of feedback, the use of students' errors, ...).

4. Aim of training model

The training model would foster a proper use of formative assessment (assessment for learning) in mathematics education in such a way that can be used in various school environments and age groups, encouraging teachers' reflective and critical thinking about effective/ineffective teaching and assessment strategies. It will include also the develop of training methodological patterns (or schema) in order to model at least five training paths or to give some methodological criteria to build on other training paths.

The training model will be used to define training paths organized through blended learning and face-to-face lessons, according to learning needs and resources (including those reported in the web-repository).

The ground pilot training courses in schools will be realized by each project partner, following a common training model, including the definition of:

¹ educationnorthwest.org

- Objectives and tasks
- Contents and methodologies
- Paradigmatic situations or case studies concerning assessment processes
- Assessment procedures and methodologies

In order to improve teacher reflective thinking and competence, each teacher-training course will provide some case studies on which teachers have to reflect, in order to analyze their teaching and assessment practices and acquire new skills in the use of formative assessment in mathematics education.

5. Structure of course: organization

- Time: From October 2015 to June 2016.

Hours	Face-to-face and Platform Training model	Only Platform Training model
Total	90	90
Face-to-face lessons	15	0
Work at home (planning lessons) and on the platform	75	90
ECTS	3	

Tools for the pilot training :

Initial and final questionnaire (to measure potential changes of teachers' conceptions about formative assessment and its practice), questionnaire on the course.

Video (videos are a tool to analyze their own practices on the formative assessment and of others).

Tutorials how to use platform and software.

5.1 Structure of the face-to-face/platform course: teachers and trainers

• Teachers and trainers

- **Teachers:** max 15 teachers of mathematics of secondary school (per groups), pre-service teachers or in-service teachers. Each training group of the teachers should be homogeneous.

- **Trainers involved:** a professor of mathematics' education and an assessment's professor (joint interventions), and the teachers from the partner schools.

• Organization of the steps of the course

Step 1: Questionnaire online

Modality: Online through a link

Before the course teachers have to complete a *questionnaire online* on beliefs and practices relating to formative assessment, based on the main questions of the questionnaire administered by each country.

Step 2: Presentation of the course - Discussion about the beliefs and practices

Modality: Face to face

Presentation of the European project and its principal objectives and potential for teachers and their students in the classroom.

Presentation of the course and its objectives, with a first theoretical overview on formative assessment. In particular, presentation of the two approaches: face to face and through the platform.

Delivery of access to the platform and explanation of how it works and its utilities. On the platform there is also a tutorial how to use it.



Discussion of administrative aspects (privacy on video, disclaimer).

Presentation of the results from the questionnaires of the FAMT&L project and first discussion on the issue of formative assessment (group brainstorming). The discussion may provide a first opportunity to become aware of their conceptions and practices of assessment.

Comparison with the beliefs of teachers of mathematics in different countries: results of European questionnaires.

Step 3 - task: First analysis of video

Modality: On platform

Each teacher has to analyze a video, identifying formative assessment situations. On platform they can find some questions about formative assessment, that can guide their analysis.

Step 4: Presentation of theory about formative assessment

Modality: Face to face

Sharing what has emerged from the analysis of video. Identification of the components of assessment formative.

Together with the trainers, the participants watch some videotaped episodes as examples to identify the practices and tools about the specific topic and comment. These videos can show examples of good practice of formative assessment or practices not entirely functional for this purpose. The videos will be shown on the platform.

Draw attention to phases and features about formative assessment through video analysis.

Step 5 - task: Assignment of specific situations

Modality: On platform

The teachers can find a lot of documents and videos about specific situations that aim to clarify the components of formative assessment's process (aims identification, criteria definition, detection of information, regulation) on the platform. They have to think over and eventually answer some questions.

Step 6: Identification of the subject

Modality: Face to face

Sharing what has emerged from teachers considerations and video analysis with user guide. Trainers show and explain indicators used by researchers and then teachers try to attach them to a new video.

Description of *some type of formative assessment context and scenarios of teaching situations* which are focused on formative assessment.

Teachers identify subject about formative assessment and plan the lessons that will be realized in the classroom and will be videotaped.

Eventually each country can decide if presenting the software (Anvil) for the video analysis.

Note. A list of possible situations that we suggest to schools for video could for example be the following already proposed within the European project (what we propose to teachers is not binding, but it serves to give teachers an idea of what we would be able to resume):

- Discussion about the feedback of written test of formative assessment
- Time to peer assessment (for instance, Group A has the tasks of the child in the group B, better not cross to each other). There must be shared criteria.
- Interaction among the class, the teacher and the student discuss during an individual interview (the class participates in the question) using observation instruments
- Group discussion in the class about a problem or discussion about the feedback of the group works
- The teacher assigns a task / problem to students and when students finish the task they ask to think about the solution strategies implemented (you write on the board of the key questions or it provides a grid) [teachers will first protocols that intend to use]
- A student makes a report to the class and the teacher and the class observe the student and discuss with him/her
- Administration of a test, which is formative assessment, and discussion with students about it
- Teacher tells the students that are going to do a written test of formative assessment
- Interview with the use of tools of observation and interaction for training (not judgment and vote)

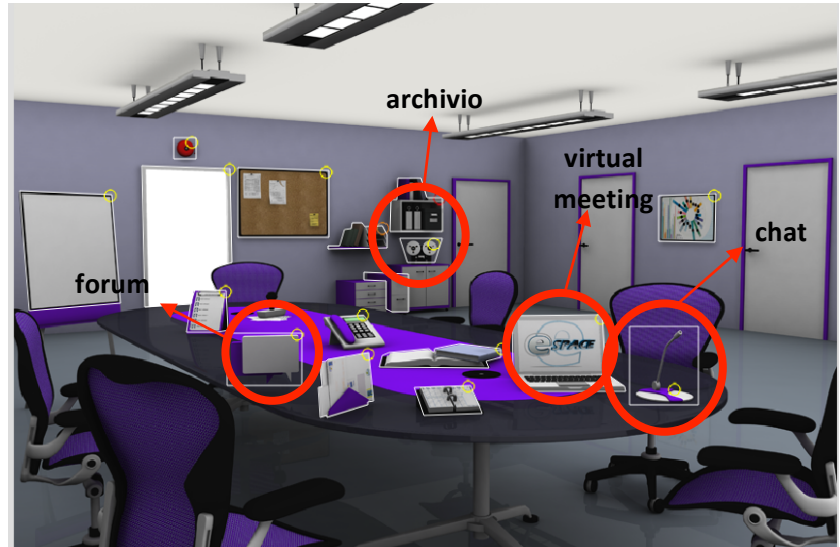
- Peer and/or self assessment situation.

Step 7 - task: Planning the lesson

Modality: On platform

On platform teachers can find an archive of videos already produced. Directed by trainers, they can view those videos useful to their specific planning (self-assessment, peer-assessment, feedback, etc.)

Individually, teachers have access to the seminars room where this more operational phase of training will be held. All discussions are stored in an archive present in the room and always available for consultation. Documentation, articles and research documentation are loaded in the dedicated folder always accessible to teachers.



Documentation, articles and research documentation are loaded in the dedicated folder always accessible to teachers.

A virtual meeting or discussion on chat is organized to monitor teachers work. Through the forum and chat of the platform, participants can interact with the trainers to plan together educational activities that focus on formative assessment.

On platform teachers can also find a tutorial about techniques to make video.

The objective of this step is to develop some documents about lesson (lesson structure, aims identification, tasks for students, material delivered to the student).

At this step the help of mathematics teachers of the partner schools is needed.

Step 8: Realize the video

Modality: In each classroom and on platform

Realize the video in class on the chosen subject of the formative assessment, that was designed in the previous steps.

At this step the help of mathematics teachers of the partner schools is needed.

The interaction between teachers: the platform also

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provides a space for informal discussions among the participants (not registered), where they can exchange ideas and opinions relating to the creation of video, without the interaction of trainers.

Step 9: Video sharing

Modality: On platform

Teachers put videos and documents about the lesson on platform: planning of lesson, paper's students, formative assessment tools,... so all the participants and the trainers can share and analyze them.

Teachers analyze the videos. Initial analyses and comments can only happen between teachers (with virtual room and chat); later will be given directions by the trainers to guide the analysis and comments on each video so that teachers may be able to regulate the next video.

Step 10: Planning, realizing, analyzing and sharing other videos

Modality: In each classroom and on platform

Depending on the choices and conditions of each country, the process (step 7-8-9) can iterate with other videos.

Step 11 – task: Questionnaire online

Modality: On platform

Teachers respond to questions of an online questionnaire on the course and a questionnaire on the formative assessment to see the possible change of conviction occurred in teachers through the training course. Results will be available on the platform.

Step 12: Drawing conclusions and taking feedback/reflection from the lessons

Modality: Face to face

Share opinions about the course and beliefs about formative assessment.

Summary: highlight the practices that have been effective and the key points of the theoretical framework related to the practical aspects.

Trainers and teachers draw together the elements of formative assessment arising from the course.

Through the various information from the course researchers can refine the grid of the video analysis.

5.2 Structure of course only on platform: teachers and trainers

• Teachers and trainers

- **Teachers:** max 15 teachers of mathematics of secondary school (per groups), pre-service teachers or in-service teachers. Each training group of the teachers should be homogeneous.

- **Trainers involved:** a professor of mathematics' education and an assessment's professor (joint interventions), and the teachers from the partner schools.

• Organization of the steps of the course

Step 1: Questionnaire online and delivery of access to the platform

Modality: Online through a link

Before the course teachers have to complete a *questionnaire online* on beliefs and practices relating to formative assessment, based on the main questions of the questionnaire administered by each country.

The teachers can find the username and the password to access to the platform in a document and an explanation of how it works, its utilities, its administrative aspects (privacy on video, disclaimer). On the platform there is also a tutorial of how to use it.

Step 2: Presentation of the course - Discussion of the beliefs and practices

Modality: On platform

Teachers first can read in a document the aims about the course and its objectives, with a first theoretical overview on formative assessment, presentation of the European project and its principal objectives and potential for teachers and their students in the classroom.

Trainers upload the results about questionnaires on the platform and pose some questions about the comparison between these questionnaires and the internationals. Teachers can find several questions about formative assessment, so that they may provide a first opportunity to become aware of their conceptions and practices of assessment.



Teachers can discuss about formative assessment in the chat or in the forum on the platform.

Step 3 - task: First analysis of video

Modality: On platform

Each teacher has to analyze a video, identifying formative assessment situations. On platform they can find some questions about formative assessment, that can guide their analysis. Some questions will help them to draw attention to the principles of the theory of formative assessment through video analysis.

Step 4: Presentation of the theory about formative assessment

Modality: On platform

Through a virtual meeting with trainers, teachers can share what has emerged from the analysis of video, identifying the components of formative assessment.

Then teachers can watch some videotaped episodes as examples to identify the practices and tools about the specific topic and comment them. These videos can show examples of good practice of formative assessment or practices not entirely functional for this purpose. The videos will be shown on the platform.

Step 5 - task: Assignment of specific situations

Modality: On platform

On platform teachers can find documents and video about specific situations with the aim of clarifying the components of formative assessment process (aims identification, criteria definition, detection of information, regulation). They have to think over and eventually answer some questions.

Step 6: Identification of the subject

Modality: On platform

The teachers can find a document with the indicators used by researchers on the platform. Through chat and forum trainers can interact with them to explain and clarify user grid and indicator's features. Then the teachers try to attach them to a new video.

In some documents the teachers can find a description of *some type of formative assessment context and scenarios of teaching situations* which are focused on formative assessment.

Teachers identify subject about formative assessment and plan the lessons that will be realized in the classroom and will be videotaped.

Eventually each country can decide if presenting the software (Anvil) for the video analysis.

Note. A list of possible situations that we suggest to schools for video could for example be the following already proposed within the European project (what we propose to teachers is not binding, but it serves to give teachers an idea of what we would be able to resume):

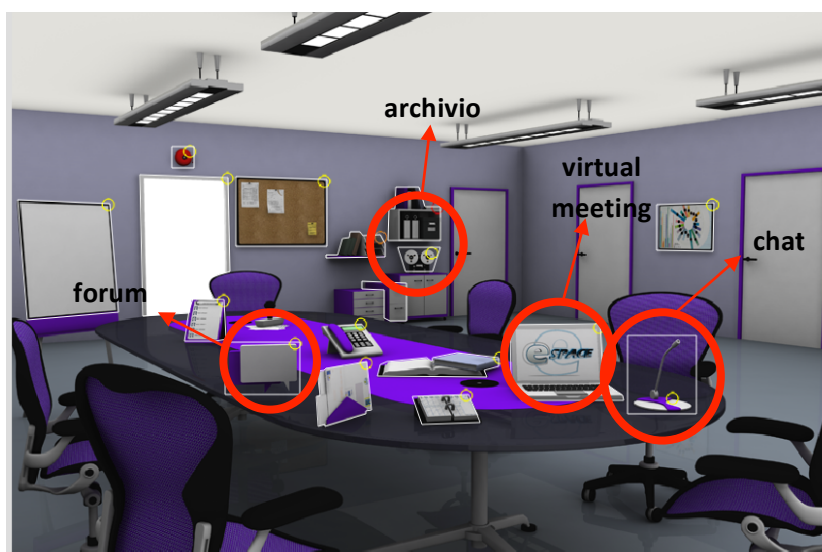
- Discussion about the feedback of written test of formative assessment
- Time to peer assessment (for instance, Group A has the tasks of the child in the group B, better not cross to each other). There must be shared criteria.
- Interaction among the class, the teacher and the student discuss during an individual interview (the class participates in the question) using observation instruments
- Group discussion in the class about a problem or discussion about the feedback of the group works
- The teacher assigns a task / problem to students and when students finish the task they ask to think about the solution strategies implemented (you write on the board of the key questions or it provides a grid) [teachers will first protocols that intend to use]
- A student makes a report to the class and the teacher and the class observe the student and discuss with him/her
- Administration of a test, which is formative assessment, and discussion with students about it
- Teacher tells the students that are going to do a written test of formative assessment
- Interview with the use of tools of observation and interaction for training (not judgment and vote)
- Peer and/or self assessment situation.

Step 7 - task: Planning the lesson

Modality: On platform

On platform teachers can find an archive of videos already produced. Directed by trainers, they can view those videos useful to their specific planning (self-assessment, peer-assessment, feedback, etc.)

Individually, teachers have access to the seminars room where this more operational phase of training will be held. All discussions are stored in an archive present in the room and always available for consultation. Documentation, articles and research documentation are loaded in the dedicated folder always accessible to teachers.



A virtual meeting or discussion on chat is organized to monitor teachers work. Through the forum and chat of the platform, participants can interact with the trainers to plan together educational activities that focus on formative assessment.

On platform teachers can also find a tutorial about techniques to make video.

The objective of this step is to develop some documents about lesson (lesson structure, aims identification, tasks for students, material delivered to the student).

At this step, the help of mathematics teachers of the partner schools is needed.

Step 8: Realize the video

Modality: In each classroom and on platform

Realize the video in class on the chosen subject of the formative assessment, that was designed in the previous steps.

At this step, the help of mathematics teachers of the partner schools is needed.

The interaction between teachers: the platform also provides a space for informal discussions among the participants (not registered), where they can exchange ideas and opinions relating to the creation of video, without the interaction of trainers.



Step 9: Video sharing

Modality: On platform

Teachers upload videos and documents about the lesson on platform: planning of lesson, paper's students, formative assessment tools,... so all participants and trainers can share and analyze them.

The teachers analyze the videos. Firstly, the analyses and the comment can only happen between teachers (with virtual room and chat); later will be given directions by the trainers to guide the analysis and comments on each video so that teachers may be able to regulate the next video.

Step 10: Planning, realizing, analyzing and sharing other videos

Modality: In each classroom and on platform

Depending on the choices and conditions of each country, the process (step 7-8-9) can iterate with other videos.

Step 11 – task: Questionnaire online, drawing conclusions and taking feedback/reflection from the lessons

Modality: On platform

Teachers respond to questions of an online questionnaire on the course and a questionnaire on the formative assessment to see the possible change of conviction occurred in teachers through the training course. Results will be available on the platform.

Through a virtual meeting, they share opinions about the course and beliefs about formative assessment.

Summary: highlight the practices that have been effective and the key points of the theoretical framework related to the practical aspects.

Through the various information from the course researchers can refine the grid of the video analysis.

Consequences of training for the European project:

- Tuning the model training courses for teachers.
- Refine the grid created by the different countries to analyze the video.
- Attempt to generalize the experience and do a reading of the results of the course, interpreted thanks also to the theoretical framework.

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