



FAMT&L

FORMATIVE ASSESSMENT IN MATHEMATICS FOR TEACHING AND LEARNING

Work Package 8 – Exploitation

Deliverable D8.3: Final Conference

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Nature	<input type="checkbox"/> Report <input type="checkbox"/> Service / Product <input type="checkbox"/> Demonstrator / Prototype <input checked="" type="checkbox"/> Event <input type="checkbox"/> Other		
Language versions	English (including interpreters)		
Target languages			
Description (limit 1000 characters)			
<p>A Final Conference was organized in Bologna and open to the public and aimed at disseminating the project's results to scholars, teachers, teacher trainers and policymaking and shaping community. A knowledge networking has been defined in order to organize plenary and parallel sessions for particular target of participants (teachers, trainers, students, professionals, etc.), including the Dissemination Prize event.</p> <p>Policy and decision makers and other major actors were invited to attend the Final Conference and asked to comment on the project's main achievements and recommendations.</p>			

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1. Introduction

The conference in Bologna has been the final meeting of the FAMT&L project at the completion of its three years of work about the use of Formative Assessment in the teaching of Mathematics. Its goal was to discuss about the state of the situation about the use of Formative Assessment in Mathematics Education and to create an opportunity for debate on the issue of teacher training with the support of video analysis.

That day has been an opportunity for international debate between universities, professors and researchers, pre-service and in-service teachers of all grade levels. The partners of the Project and the teachers who have been involved by the Research/ Training FAMT&L have offered plenary lectures and times of open-discussion about formative assessment in mathematics and on the main results of the Project.

Some international, national and regional institutions, engaged in the development of the teaching professionalism and the quality of educational systems, have participate to this conference.

The conference also included the appointment of “Dissemination Prizes”, awards that have been won by the schools that had produced the “best” videos on formative assessment in Mathematics, within the competition previously launched by the FAMT&L project.

Among the other people that were at the meeting, in the following list the several associations of the ones who signed the presence book is reported:

UNIBO personnel, SUPSI personnel, UCP personnel, inHolland personnel and their “critical friends”, UCY personnel, Teachers from schools of various degrees, University Students, Researchers from other University, INVALSI personnel, INDIRE personnel,
Publishing Houses personnel.

2. The Conference Program:

OPENING SESSION: H 9.00

Greetings and welcome to participants from:

Mirko Degli Esposti (Deputy Rector, Department of Mathematics, UNIBO);

Alessandra Scagliarini (Vice Rector for International Relations, UNIBO);

Elena Luppi (Rector’s Delegate for Gender Equality, Dept of Education Studies, UNIBO);

Francesco Girotti (Manager of DIRI, International Relations Division, UNIBO).

TOPICS (MORNING): H 10.00 - 13.00

- Presentation of LLP-Comenius Project FAMT&L:

Giorgio Bolondi and **Ira Vannini** (University of Bologna, UNIBO).

- Formative Assessment (A shared definition):

Athanasios Gagatsis, Paraskevi Michael-Chrysanthou, Theodora Christodoulou and **Iliada Iliia** (University of Cyprus, UCY).

- The Questionnaires Results:

Federica Ferretti and **Stefania Lovece** (University of Bologna, UNIBO).

- Pilot course. The main results

Silvia Sbaragli, Elena Franchini and **Miriam Salvisberg** (University of Applied Sciences and Arts of Southern Switzerland, SUPSI).

- Our model for the video analysis

Laurent Jeannin and **Fatiha Lograda, EMA** (University of Cergy-Pontoise, UCP).

- The quality of FAMT&L Project. Open discussion with teachers & schools

Seerp de Blauw and **Rob Velder** (InHOLLAND University).

TOPICS (AFTERNOON): H 14.30-18.00

- Final Prize of Competition and presentation of Video Winners

Alessandro Gimigliano (University of Bologna, UNIBO).

- Assessment Beliefs and Gender Gap.

Carlo Tomasetto (Rete Witec, European Association for Women in Science, Engineering and Technology, UNIBO).

- Round Table: Promote the skills of mathematics teachers in the use of assessment.

Mariolina Bartolini-Bussi (University of Modena and Reggio Emilia); **Maria Chiara Pettenati** (INDIRE, National Institute for Documentation, Innovation and Educational Research); **Rossella Garuti** and **Stefania Pozio** (INVALSI, National Institute for the Educational Evaluation of Instruction and Training). Chairpersons: **Giorgio Bolondi** and **Alessandro Gimigliano**.

3. Topics (by the Project's partners)

3.0 Presentation of LLP-Comenius Project FAMT&L:

Giorgio Bolondi and **Ira Vannini** (University of Bologna, UNIBO).

Welcome, everyone, to this Conference during which we will present the results of a project we have loved so much over the last few years and that we think will greatly enrich with many innovation in the schools and in teachers' training.

The FAMT&L project took inspiration from a reflection on a big problem that affects the Italian and European schools: the gap in the students' academic results in Mathematics. Especially secondary-school students, aged 11 to 15: the school-leaving age all over Europe.

The gap in the students' academic results is an extremely important social problem, especially when it concerns skills that are key to asserting one's right to citizenship. A review of the OECD-Pisa results and the findings of other national surveys show that, even when (in a country or in a region) higher results are usually found in mathematical skills, the serious problem is the inconsistency of the results, the gap between groups of students who are successful and big groups of students who "fail" and are left out of the key skills of mathematical thinking.

There's no doubt that it is a problem that goes far beyond the boundaries of schools: it is a problem of social injustice and the failure of the expected democracy of education.

The reasons for such a complex issue depend on multiple factors:

- Variables of the macro-system (the country's educational policies; regulatory measures on teachers' professional skills; sociocultural factors associated with education);
- Variables of the meso-system (the schools' in-house organisation; constraints and available resources; management of local self-government in different socio-economic and socio-cultural contexts and backgrounds);
- Variables of the micro-system (management of teaching processes in the classroom; students' and teachers' psychological and motivational factors).

I have certainly not listed all the variables, though they already suggest how complex and systematic the problem is and how it needs to be addressed from an equally complex and politically farsighted perspective.

In our opinion, the key question is: how to promote a change in schools that may lead to better quality as well as fair academic results for the students?

Our FAMT&L project did not want to lose sight of the complexity of the problem, despite looking into it through the magnifying lens of the teachers' professional skills. As shown by the international surveys, the 'Teacher' is a variable that plays a key role in the achievement of good academic results. It is certainly not the only one, but it has a powerful impact, especially on the micro-system, i.e. within the teaching-learning process.

So, the question is: HOW TO ACT UPON THE TEACHERS' PROFESSIONAL SKILLS?

And then: WHAT TO DO TO CHANGE THEIR IDEAS AND THEIR PRACTICES?

These two big questions are essential, both in the meso-system (within the schools and in the Staff-Development initiatives that are planned and developed within them) and in the macro-system, that is, in the national educational policies and in consistent, scientifically-effective teacher-training choices.

The FAMT&L project wanted to give a few answers to these two key questions, but there is still a lot to do.

We believe that the results you can learn about today are extremely interesting. We are going in the right direction: forms of training courses based on filmed video-analyses can bring some interesting change in the ideas, as well as in the intended

practices. As we will see, this is about keeping monitoring the practices and reflecting on classroom videos, all the time.

The key point we have worked at is the teachers' ideas and assessment practices: the aim was to look into the existing assessment practices and compare them with the formative assessment practices.

We learn from Black&William (1998) that formative assessment is the key factor for changing a teaching method. The way to turn selective teaching into successful teaching, for all the students.

In other words, formative assessment is the school-reviving factor: both within the 'classroom' micro-system and, as cultural change, within the schools and across the entire educational system. The change consists in making teachers responsible for analysing and re-enacting the teaching-learning process. This means:

- Having effective, reliable tools to measure skills and abilities,
- Teachers who know how to use such tools in the classroom,
- Getting used to have an analytical approach to every student (avoiding first impressions and generalisations),
- Being able to assess and change one's teaching method (redesign it), using multiple educational mediators,
- Being able to build proper educational feedback for each student, which can help value mistakes and promote new learning.

In other words, a deep belief that teaching is an extremely powerful tool in the teachers' hands and that any student can achieve good or excellent skills in key areas.

I think that the groups of scholars who explore such issues are a valuable asset. The results, so far still incomplete, act as an important beacon to steer the teachers' training schemes and make a contribution to the debate, not least, or above all, within the macro-system.

3.1 Formative Assessment (A shared definition):

Athanasios Gagatsis, Paraskevi Michael-Chrysanthou, Theodora Christodoulou and Iliada Ili (University of Cyprus, UCY).

The exposition cured by the Cyprus group gave an analysis of several definitions of FA, also from an historical point of view; the most shared definition that was proposed runs like this:

“A process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes”

Attention was given by the essential role of feedback, and to several aspects of FA, such as Formal and/or Informal FA, the Assessment Process, the possible techniques. A summary of these aspects follows:

4 Formal formative assessment

- information is obtained based on the whole class,
- it usually begins with students carrying out an activity designed or selected by the teacher,
- practices take the form of curriculum embedded assessments,
- can take the form of direct questioning, quizzes, brainstorming, question generation, and the like. (Bell & Cowie, 2001)

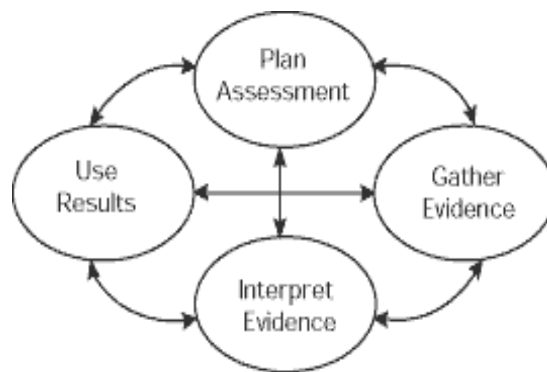
The implementation of this type of assessment is **planned in advance** by the teachers and it can be conducted at the **beginning, during, or end** of a unit.

4 Informal formative assessment

- can take place in any interaction between teacher and his/her students (anytime)
- can engage whole class, small group or individual interactions
- is not to be planned in advance, because it can happen at any time
- there is no specific activity designed for students

Teachers **cannot predict** exactly when they will be able to gather evidence about students understanding during the lesson of non-planned activities, but they can give students varied **opportunities** for doing so (e.g. by creating more interactions in class, group discussions, or informal observations).

4 FA Process, a scheme:



4 Techniques for FA

The following table summarizes some of the techniques in FA

Purpose	Techniques	Results
	Teachers	
Assessment for teaching and learning regulates the teaching-learning process and establishes a dialogue between teacher and student	A teaching methodology which can respond effectively to different learning times for each student, to their different learning styles and to their zones of proximal development. Formative feedback and feed forward.	To allows teachers to reflect on and modify their own practices. To design educational interventions and evidenciate the outputs of teacher's choices (transposition of mathematical contents, interface between contents and methods).
	Students	

<p>Students are to acquire the basic skills of a discipline; to identify the strengths and the weaknesses of their learning.</p> <p>To give information, both feedback and feed forward and both in and outside the classroom, related to the development, by the students, of life-skills in mathematics.</p>	<p>To promotes students' ability for self-assessment and peer-assessment.</p>	<p>To learn (for all students) through differentiated teaching (different rhythms, different teaching and learnings strategies). Promote students' active participation in the teaching-learning process which involves the student in the analysis of their own errors/weaknesses.</p>
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3.2 The Questionnaires Results:

Federica Ferretti and **Stefania Lovece** (University of Bologna, UNIBO).

Ferretti and Lovece exposed the results of the questionnaires that were handed out at the beginning of the project and were aimed to study the attitudes of teachers and students towards FA (see Table 1 for the number of people involved). Such results have constituted a solid reference for the implementation of the pilot courses that were another step of the project.

Among the several instances that emerged, the following was noticed:

There is a **gap between the students' and the teachers' beliefs** of assessment in classroom:

Students have **positive beliefs** about the purpose of assessment and about the **use of FA practices** by the teachers, but there is a **contradiction between teachers' beliefs and practices** ; they have positive beliefs about the purpose of FA but they do not seem to know how to apply it in the classroom. Moreover, teachers mostly use **traditional practices** of summative assessment.

Moreover, teachers mostly agree on:

- the use of continuous feedback that can help students to identify how they can improve their learning in mathematics,
- the importance of sharing with students of the learning objectives in mathematics that will achieve

But the answer of the students seem to indicate that such opinions are not put in action in the practices of the teachers themselves!

Anyway, many teachers signal that they feel that their practices about FA should be improved, and that courses which could help them in several aspects of that practice could be useful for them (see Table 2). Topics of interest for the teachers' training (in all the partner countries, with a few different shades) are related to methods to assess students' achievement, to the application of different assessment methods, to using assessment methods to provide students with feedback and to develop their abilities to teach effectively.

We could say that there is a general agreement between the teachers from the five countries regarding the topics that they feel more in need of training.

	CYPRUS	ITALY	SWISS	FRANCE	HOLLAND
STUDENTS (N=1649)					
Grade 1	108	247	72	17	43
Grade 2	72	139	67	63	152
Grade 3	128	74	78+ 49	27	113
Grade 4	--	--	17+ 57	21	105
No Answer	0	0	0	7	47
Total	308	460	340	134	460
TEACHERS (N=201)	65	58	69	21	7

Table 1. Number of teachers/students involved

Given assessment workshops in the future, please indicate which topic(s) you would like to attend.	Cyprus (N=65)	Italy (N=39)	Swiss (N=69)	France (N=21)	Nether. (N=7)
Methods to assess students' achievement	64,6	45,2	23,2	23,8	0,1
Encourage students' participation in classroom activities	53,9	74,2	23,2	0,0	0,2
The application of different assessment methods	64,6	41,9	43,5	33,3	0,2
Analyzing assessment method results	55,4	35,5	33,3	14,3	0,1
Using assessment methods to provide students with feedback	58,5	54,8	17,4	9,5	0,3
Using assessment methods to improve students' abilities	55,4	41,9	46,4	14,3	0,2
Using assessment methods to develop teachers' abilities to teach effectively	52,3	67,7	46,4	23,8	0,1
Higher order questioning techniques	44,6	29,0	53,6	14,3	0,1
Use of misconceptions	47,7	35,5	26,1	14,3	0,3
Feedback as comments and not grades	33,9	32,3	24,6	9,5	0,1
Oral feedback	33,85	16,1	33,3	4,8	0,1
Sharing assessment criteria	27,69	25,8	15,9	19,0	0,1
Peer assessment,	36,92	19,4	15,9	14,3	0,3
Students' self-assessment	47,69	38,7	31,9	23,8	0,3
Other topic	3, 08	----	----	4,8	0,1

I would not like to attend any assessment workshop	10,77	3,2	29,0	4,8	0
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Table 2. Request of teachers about their training.

3.3 Pilot course. The main results

Silvia Sbaragli, Elena Franchini and Miriam Salvisberg

(University of Applied Sciences and Arts of Southern Switzerland, SUPSI).

The aim of the courses was to promote formation of the teachers about the use of FA, by focusing on the analysis of videos about moments of FA in the classroom.

The videos have been made in the several partner countries with the support of schools which were associated to the project, and have been gathered in a virtual platform (web repository) in the FAMT&L site. This methodology for the formation should improve the way the teacher use FA and promote the effectiveness of the student's learning; actually the use of video should:

- help to build knowledge, competence, and professionalism about FA;
- help to reflect about the students way of thinking and their possible misconceptions;
- help in analyzing and think about the teachers' own valuation practices

The following table shows the data on the structure of the pilot courses and the number of teachers involved.

	UNIBO	SUPSI	UCY	INHOLLAND	UCP
How long	30 hours	6 hours	Two courses of 12 hours:	12h in course, then 6h in PLG-meetings	6 hours
When	5 meetings October 2016	2 meetings (3h) 7 march 2016 18 april 2016	3 meetings (4h each) June and July 2016	4 meetings (1,5 hours), June-October 2016	October 2016
Number of teachers	15-20	18-24	Group 1: 16 Group 2: 10	18	3500 students (of ESPE from Versailles)

Kind of teachers	Mainly High and Low Secondary Teachers	Teachers in training who teach part time as teachers in middle school.	Group 1: post-graduate teachers (kindergarten/primary/secondary) Group 2: secondary mathematics teachers in service	In-service teachers	Teachers in training who teach part time and full time as teachers in a class of middle school.
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Common practices in all courses were:

- Keep track of the changes in the convictions and beliefs of teachers. Trainers use a structured and **common grid** that detects relevant points about the opinion, meaning and use by teacher about FA.
- Drawing conclusions about formative assessment. Trainers and teachers analyze together the elements of formative assessment arising from the videos in the course.

Indications that emerged from the courses were:

- the main resistences by the teachers have been the fear to have to change a lot in their everyday practices and to have to dedicate much time and energy to FA.
- During formation, many participants realized that they already used FA practices with their class, just they didn't think about them as such, so what they have to refine needed less changes than they thought.

— FA should become a constant practice that should be integrated into every lesson. The FA does not necessarily have to be present during the whole lesson. The lesson may contain brief moments of FA with individual students, with groups or with the whole class.

3.4 Our model for the video analysis

Laurent Jeannin and **Fatiha Lograda, EMA** (University of Cergy-Pontoise, UCP).

The intervention is aimed to present the theoretical and methodological framework for the analysis of the videos about situation of formative assessment (in Mathematics) in the classroom.

Procedural choices are considered (categories and analysis grid) in order to show how they refer to precise theoretical guidelines. It is highlighted as the videoanalysis has been used as a technique of formation in the pilot courses, with the support of the *espace* platform.

Theoretical framework

In a theoretic framework that goes back both to authors like Haddon, Grieson, Mead et Bateson with respect to the use of films to pass the limits of verbal language in showing the “intangible aspects of culture” and to authors like Brousseau, Chevallard, Robert, Sensevy, Mercier & Schubauer-Leoni (for the *didactique des mathématiques*), the group of the University of Cergy-Pontoise, has developed a long practice in the use of videos for the training of mathematics teachers, and this expertise has been used for the work within the FAMT&L project.

The main idea is to describe via videos moments of the teaching activity in order to describe and evidentiare the necessary resources for the formation of a good mastery of the relations and situations in the classroom, with regard to the different aspects of the formative assessment.

Altet M. (1994) proposes an approach to the professional formation professionnelle of the teacher centered on the appropriation of the interaction process and « *la circulation des flux d'information entre les acteurs enseignant-élèves* ».

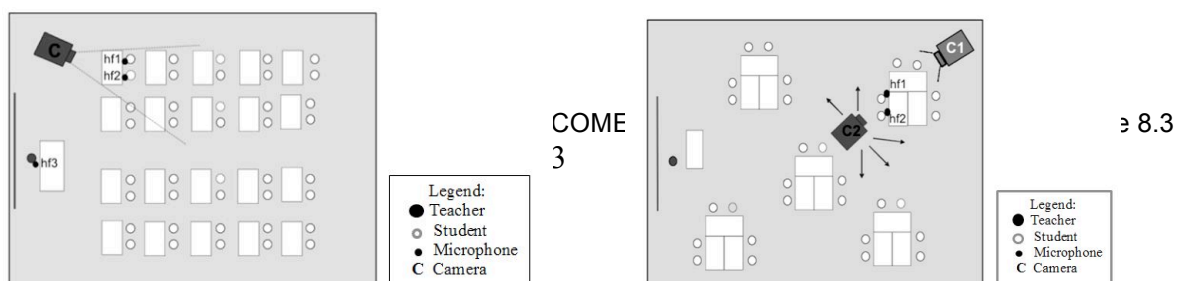
We have to question the problematic of the conditions of the practices and of the tools to be operated in such a way to allow to acquire the professional skills via the plans, the treatment and adjustment of the interactions during the classroom practices. This will mean to be able to analyze the different changes that the situation in class is going through. **The video is the documentation of such professional actions.**

The following table gives an example of good steps in using FA:

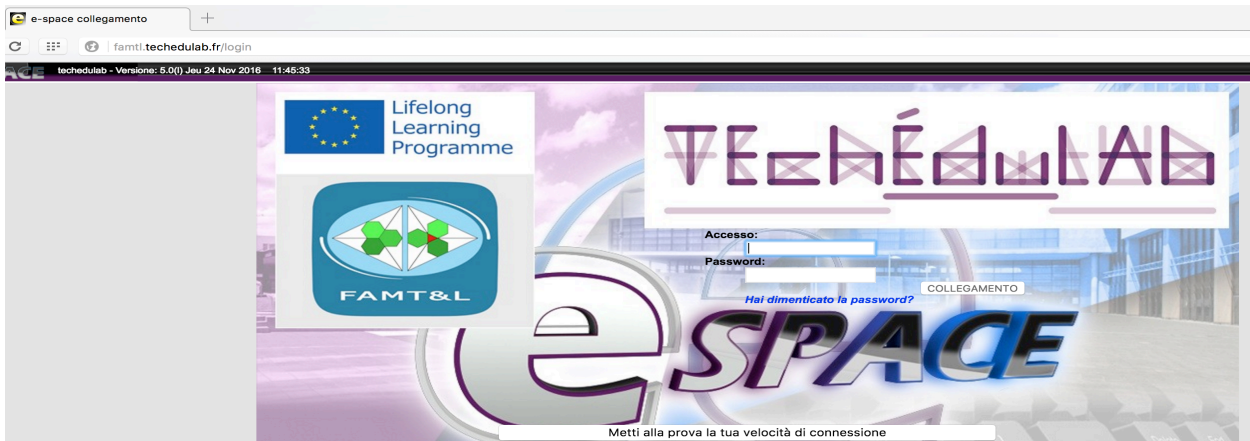
1. MATHEMATICS CONTENTS	2.TIME OF ASSESSMENT	3.TOOLS/STRATEGIES	4.PHASES OF ASSESSMENT
<p>1. Describe the main content which was programmed</p> <p>a. CONTENTS</p> <ul style="list-style-type: none"> - Numbers - Spaces and shape - Uncertainty and data - Relations and functions <p>b. CAPABILITIES</p> <ul style="list-style-type: none"> - Communication - Mathematizing - Representation - Reasoning and argumentation - Devising strategies for solving problems - Using symbolic, formal and technical language and operations 	<p>Say if the assessment period comes before, during or after the teaching moment:</p> <ol style="list-style-type: none"> 1. Ex ante 2. In itinere 3. Ex post 	<ol style="list-style-type: none"> 1. Use of objective tests: <ol style="list-style-type: none"> a) Multiple Choice b) True/False c) Correspondences d) Cloze 2. Use of open or semi formalized strategies of assessment <ol style="list-style-type: none"> a) Oral interrogation b) Semi-structured test (oral or written problems solutions, ...) c) Traditional trials (argumentative texts, ...) d) Peer-assessment e) Self-assessment f) Observation of student's activity g) Discussion /questioning in the classroom 	<ol style="list-style-type: none"> 1. Presentation of the tests/trials 2. Administration of the tests/trials 3. Recording data of student performances 4. Giving back the results (Correction; Comments about the work; Explanation of the mistakes)

The techniques

At this aim, it is important to master the main techniques of video making such as how to position both the camera, and the microphones, for good quality of sound and image, e.g. see the following pictures:



In order to collect and make videos and their analysis allowable, we need a good web platform. Our group uses the platform *espace*, created by UCP.



Promoting Effective Classroom Interactions and Teaching Practices

In order to enhance students' experiences in school, and thus their academic and social success, it is necessary to not just measure but also to improve these types of interactions between teachers and students. There are at least three key factors that need to be in place in order for such improvements to occur :

1. Teachers, teacher educators, and school personnel must have a common vision and shared goals about how to make each classroom maximally successful.
2. There needs to be some reliable and valid mechanism in place to assess the standing of classrooms vis-à-vis these goals.
3. Teachers and other school personnel need access to professional development experiences that are effective in making progress towards these goals.

A well-defined classroom observation system can assist in addressing all three of these factors.

In addition to helping define clear goals and creating a shared purpose, classroom observations can provide an objective method for measuring progress towards these goals and provide a framework for giving constructive and focused feedback that helps teachers incorporate higher levels of desired behaviours into their interactions with students in the classroom.

The goal is to develop objective observational measures of classroom instruction to serve as quantitative indicators of teaching practices in formative assessment.

It involves from the methodological point of view :

- to have the same methodology approach to collect the data ;
- to use the same process to reduce video data ;
- to exploit the data in the same way.

We want to study formative assessment process :

- standardized procedures for using the camera ;
- standardized procedures for analyzing videos.

We must always have a description in natural language describing the course on a scale of macro time (about 5 minutes; the notion of script allows a first data processing). The analysis of videos will be on two levels, Micro and Macro:

Micro

Matter of Seconds => defines the components of the teaching situation from several points of view.

The micro analysis can work :

- Content of verbal and gestural interactions: word, sentence, movement and displacement;
- Operations of students and teachers (activity theory)
- Quantitative Analysis => grid video analysis on three areas: status, content and actions

Macro

Matter of Minutes => defines the teaching situation from several points of view

The macro analysis can work:

- Sense of verbal and gestural interactions: knowledge engaged, type of activities, actions, reactions and feedback;
- Operations of students and teachers (sense of activity theory)
- Qualitative analysis => relation between different data and their effects and results => example: an organization for knowledge content for production and evaluation => systemic analysis

The correct use of videos can be of great support for the research in the teaching of mathematics; moreover it can allow a work of description of the phases of the formative assessment process, and so to highlight the impact of the qualities of interactions and learning as a function of the styles of teaching (see also PISA).

3.5 The quality of FAMT&L Project. Open discussion with teachers & schools

Seerp de Blauw and *Rob Velder* (InHOLLAND University).

The presentation was a quite interactive one with the public of the conference; crucial questions were asked to everyone present in the room, starting from a video which presented characters of teachers and students and their behavior.

Some of the questions had the form of statements about which one had to express agreement or not, such as:

— **Formative assessment will change the classroom environment in a more effective way than any other intervention.**

— **The teacher makes the difference**

— **Formative assessment should be the sole focus of the**

professionalization of every teacher.

Each question, after a “sit or raise” vote, was followed by interesting discussions and analysis of several aspects of FA.

Standard ways of teaching practice and evaluations of the students mistakes were presented and discussed (e.g. individuating the causes of students mistakes in “what students are”, or “what teachers do” or “what students do”, a judgment which says a lot about a teacher's attitude).

At the end, the statement much agreed upon was:

Formative assessment is the bridge between teaching and learning.

4. The competition and its final prize

The FAMT&L contest aimed to enhance the creativity of math teachers by encouraging them to use mathematics in an innovative way of expression and communication through Formative Assessment. The particular format of the contest is that the participants (teachers) are to elaborate a short video with their students creating small situations of Formative Assessment in maths classrooms, so to their interest towards the implementation of Formative Assessment techniques and practices.

Here is a brief description of how the competition was organized.

The Product

The product had to be a short video (max 5 minutes) of a teacher (and students), presenting one of the following situations:

- providing a definition/ a description of Formative Assessment with any means (i.e verbally, using pictures, diagrams or other representations, with movements e.t.c)
- proposing a specific Formative Assessment technique to be used in mathematics teaching
- presenting a short episode of the implementing Formative Assessment in classroom, in which a particular technique is used.

Participants

- The participants could be secondary education math teachers from public and private schools.
- Each participant was be representing his/her school.

Steps of the contest

1. Each video had to be uploaded on the competition website.
2. The best 2 participants from each country have been selected, without ranking, by each partner country.
3. All the selected participants' videos from each country have been judged in the final stage from the Jury.
4. At the conference in Bologna, the Jury announced the First, Second and Third Prize.

The Evaluation

The selection of the winner in the competition and the other finalists was conducted in the final meeting in the 24th of November, a day before the final conference. In this phase of the meeting three people of team of Swiss, three people of the Cypriot team, four of the Italian team and two researchers from Netherlands were present. French team didn't participate in this procedure. Concerning the procedure of the evaluation to choose the finalists, four criteria were set:

1. Relation to formative assessment
2. The role of the teacher
3. Effectiveness of the interaction between teacher-students
4. Effectiveness of the interaction between students

For each criterion the members of the Jury could assign a mark ranging from 1 (low grade) to 3 (high grade) points.

The Jury

Giorgio Bolondi, Theodora Costantinou, Seerp De Blauw, Federica Ferretti, Elena Franchini, Athanasios Gagatsis, Alessandro Gimigliano, Fatiha Lograda, Stefania Lovece, Miriam Salviesberg, Silvia Sbaragli, Ira Vannini, Rob Velder.

Prizes

- First Prize: 500€ and certificate of success.
- Second Prize: 300€ and certificate of success.
- Third Prize: 200€ and certificate of success.
- The prizes have been given as equipment and material to be used in the winners' schools (such as computers, tablets, interactive white boards e.t.c).

The winners

First prize. Netherlands: Luzac lyceum Amsterdam, Uiterwaardenstraat 263, 1079 CR Amsterdam.

Second prize. Switzerland: Scuola media di Gravesano, Via Str. Regina 6929, Gravesano, Canton Ticino, Svizzera.

Third prize (ex aequo). Cyprus: Olympion Private School Cyprus, 25 Martiou 87, Palaiometochos 2682.

Third prize (ex aequo): Italy: Istituto Comprensivo N.5 Bologna, via A. di Vincenzo 55, 40129, Bologna.

5. The contributions

5.1 Assessment Beliefs and Gender Gap: *Does assessment make a difference?*

Carlo Tomasetto (Rete Witec, European Association for Women in Science, Engineering and Technology, UNIBO, Dept. of Psychology).

The first subject of the talk was Math Anxiety and its relation with the evaluation process. Evaluation processes are implicitly or explicitly activated any time activities' outcomes are relevant. Individuals compare to relevant others or to internal standards in order to

Estimate their value

Protect their self-worth

Improve their ability

But it is important to point out that **not all individuals are equally attuned to evaluation**. In particular, mathematics in the subject were more relevant difficulties are recorded, so to speak of

Math anxiety

A feeling of apprehension and fear associated to the actual or anticipated manipulation of numerical information (Ashcraft, 2002). Apprehension: Negative thoughts related to the self and/or to the task

Fear: Altered physiological and neural reactivity (arousal). In particular we have:

Learning math anxiety: Fear/discomfort when exposed to numbers

Evaluation math anxiety: Fear of failure when math ability is assessed.

The consequences of math anxiety

1) Anxiety disrupts math performance (Eysenck et al., 2007)

Worries and arousal interfere with cognitive effectiveness. Attention diverted to threatening cues. Negative thoughts occupy memory resources.

2) Repeated failures increase anxiety (Hopko et al., 2002) . So there are reciprocal influences between anxiety and performance.

3) Anxiety prevents engaging in math-related activities.

-Prevents exercising math skills,

-Reduces time dedicated to learning,

-Predicts the usage of simplified heuristics instead of accurate math reasoning,

-Reduces time spent in math reasoning,

-Promotes withdrawal from math-intensive courses,

-Reduces career opportunities.

Moreover, Math anxious adults refrain from using math in daily situations (Jansen et al., 2013; Morsanyi et al., 2015), e.g. They do not check return money in a shop or fail to predict consequences of risky behaviors.

Math anxiety and the gender gap in math

30% of 15-year-old students report negative feelings toward math (OECD, 2015), but only 6% of girls expects to use math skills in their future career (boys: 22%; OECD, 2012). The gender gap in math anxiety is three-times as large as the gender gap in observed math performance.

“Women who endorse stronger **gender stereotypes** about math overestimate their levels of anxiety in response to a math task” (Goetz et al., 2013; Bieg et al., 2016), and “In women (but not in men) anxiety mediates the link between math competence and use of math skills in daily life” (Jansen et al., 2014)

Research question

Do teachers with different approaches to evaluation affect the degree of math anxiety in their pupils?

Some conclusive remarks

- Research on classroom practice and math anxiety is strikingly scarce.
- The expectancy that teachers can make a difference is commonplace – and yet evidence is poor
- Need for multi-method approaches
- Effects (when detectable) are small, but significant for girls.
- If teachers do really make even only a small difference, they still can do something for girls.
- Do not dismiss small effects; small differences in math anxiety in adolescence can make a big difference in the relation with math over the life course
- Math (and math anxiety) go well beyond teachers, pupils, and schools.

5.2 Round Table: Promote the skills of maths teachers in the use of assessment.

Mariolina Bartolini-Bussi (University of Modena and Reggio Emilia); **Maria Chiara Pettenati** (INDIRE, National Institute for Documentation, Innovation and Educational Research); **Rossella Garuti** and **Stefania Pozio** (INVALSI, National Institute for the Educational Evaluation of Instruction and Training).

Garuti and Pozio explained how the tools that INVALSI has for the teacher to use, gathered on line in their website can be of use for a reflection about formative assessment. INVALSI has on line, for all to use, the results of the national test (for Math and Italian language) for students at various level of their studies and also analysis on such results. The analysis of this vast material can give precious indications and feedback to teachers; two aspects were highlighted: the possibility of examining the different strategies that students use to solve the same problems and the analysis of their mistakes; the fact that a great number of wrong answers have been studied and categorized is a great opportunity for the interpretation of the most common among the errors of the student (and so to rethink also the teachers' own strategy in confronting with such mistakes and to help students to develop self-valuation strategies about their mistakes).

Bartolini-Bussi concentrated her introduction on the *lesson study* method, as developed in China, that she has studied and analysed deeply. The chinese (but also japanese) tradition is of an in service formation via the lesson study method, which is based on preparation of a lesson by a teacher (or group of teachers), then observation in class of such lesson with the presence of colleagues and/or experts and then discussion among all of them about the observed lessons.

This method produces models of lessons which are technically almost perfect, with appropriate timing, good interplay between explanations by the teachers and written work by the students, work in small groups and oral exposition of such work. One essential characteristic of this method is that the classroom is considered a public space, where external observation is encouraged; the classroom is not a private space where the teacher works in complete autonomy, without any quality control: the common aim is improvement.

Pettenati has talked about the formative needs of new in-service teachers and the activities of INDIRE in this direction. The following table highlights the kind of competences that the teachers themselves indicate as needed.

1. TEACHING COMPETENCES
To organize and handle learning situations
To handle the several steps of the learning process
To study and evaluate the learning processes of the students, following a formative approach
To have students participating in their learning and work processes
2. COMPETENCES ABOUT IN-SCHOOL PARTICIPATION
To work in groups
To participate to school management
To inform and involve parents
3. COMPETENCES ABOUT TEACHERS' OWN FORMATION
Use the new technologies
To face the duties and the ethical problems implied in the teacher's profession
To cure their own ongoing formation

Among the other tools and strategies (e.g. to keep data about their own work, peer to peer work with tutors during formation and looking for feedback from their own practices), a particular attention has been given to the use of videos as a formation instrument.

Many INDIRE courses use video-analyses as an effective way to develop a greater awareness about the teachers' own practices in class. Teachers should develop a "professional vision" about their own work, which enables them to be aware of the several aspects of the situation with the students during the learning process, in order to reconsider and adapt their practices.

The following table shows which aspects have been more affected by the video analysis work.

A quali aspetti l'osservazione del video ti ha consentito di porre attenzione?



INDIRE plans to create a “Library” of the best materials used in the formation of teachers, at the beginning gathering material from their own work, but with the aim also to gather from many different experiences in the sector.

After the initial talks, the debate about all the participants on the proposed themes has been wide and interesting, full of hints and stimuli for future work.

6. Final Considerations

The conference has been an important goal for the project, both as a moment of evaluation of the results that have been obtained and as an occasion for the dissemination of such results.

During the conference all the results of the whole project have been presented (see section 3) and discussed. One first aspects was the analysis of formative needs (from surveys of results for teachers' and students' questionnaires) and, right after that, the outcomes of the pilot courses that have been held in the five partner countries.

Such courses have been presented and described by SUPSI and in particular they showed both the interest in the model for videoanalysis that has been elaborated within the project and the formative effectiveness of the different implementations in the five countries.

Teachers and principals of several schools of different levels (both associated to the project or not) have been involved in the debate about the results. Moreover, the “Rete WiTec” participate to this debate by analyzing some of the results and highlighting the gender differences in the ideas about evaluation among the students in high and junior high schools. This subject could have important follow ups in the tuning of the FAMT&L model of teachers formation (also considering the data from the last international researches from PISA and TIMSS).

As regard the dissemination, the conference has been a fruitful occasion to spread the information about the outcomes of the project to the stakeholders of the five countries. In fact among the participants there were, besides teachers involved in the project, other teachers, people from agencies for formations and for valuation of the school system (Italian INDIRE and INVALSI), from publishing houses and researchers from other universities.

For all these reasons, the conference was an opportunity to open new possibilities for agreements in order to sustain the future of the project, by maintaining the on line video repository and to have new editions of formation courses about FA in the teaching of mathematics. Moreover, during the conference, the volume about the outcome of the FAMT&L project (which will be published in the spring of 2017) has been presented.

7. EVALUATION OF THE FINAL CONFERENCE (by InHolland)

The final conference were to present the outcomes of the project the project partners organized a one-day-conference. The morning session was aimed at sharing and discussing the outcomes of the project. It consisted of five lectures, each presented by one of the partners in the consortium related to their individual work packages. During the afternoon session there was a lecture by guest presenter Prof. C.Tomasetto on *Assessment belief and gender gap*. The conference closed with a round table discussion.

The evaluation of the final conference consists of three parts:

- Accommodation and facilities
- Content in relation to relevancy for attendees
- Quality of lectures

All attendees were asked to reply via an electronic survey. Anonymity was guaranteed.

Overall conclusions

The goal of the consortium was to present the outcomes of the project to a relevant audience. This was achieved as can be concluded from the questionnaire because:

- High scores on questions on relevance and importance
- High scores on the individual lectures
- High percentage of satisfaction on accommodation and facilities

Overall it can be concluded the final conference presented the results and accomplishments of the partners well. This was done in a friendly yet constructive atmosphere. There was interaction between lecturers and attendees.

The results of the evaluation are stated below.

Accommodation and facilities

With regards to the overall organization of the conference, how satisfied were you about:

	very satisfied	satisfied	neutral	unsatisfied
The accommodation	100,00%	0,00%	0,00%	0,00%
The facilities (ie translation)	75,00%	25,00%	0,00%	0,00%
the lunch	66,67%	33,33%	0,00%	0,00%
The structure/schedule	83,33%	0,00%	16,76%	0,00%

Attendees were in all satisfied with the accommodation, facilities such as translation and lunch. The structure and schedule was well received.

Content in relation to relevancy for attendees

Please give your level of agreement for each statement

	very agree	much agree	neutral	disagree
Formative assessment is important for me in my everyday work.	57,14%	42,68%	0,00%	0,00%
The information presented in the lectures were relevant to me.	42,86%	57,14%	0,00%	0,00%

The length of the lectures was good.	57,14%	42,68%	0,00%	0,00%
The lectures were of good quality.	57,14%	42,68%	0,00%	0,00%

The content of the lectures were relevant to the attendees. The lectures were of good quality and of adequate length.

Quality of lectures

Please give your score from 1 to 5 (5 being best) for each lecture (morning session).

	5	4	3	2	1
Presentation of LLP-comeniusproject FANT&L by G. Bolondi and I. Vannini	80,00%	0,20%	0,00%	0,00%	0,00%
Formative Assessment (shared definition) by A. Gagatsis, P. Michael-Chrysanthou, T. Christodoulou and I. Ilia	0,50%	0,50%	0,00%	0,00%	0,00%
The Questionnaires results by F. Feretti and S. Lovece	0,57%	0,43%	0,00%	0,00%	0,00%
Our model of video analysis by L. Jeannin and F. Lograda	14,29%	42,86%	28,75%	14,29%	0,00%
Pilot course, the main results By S. Sbaragli, E. Franchini and M. Salvisberg	42,68%	57,14%	0,00%	0,00%	0,00%
The quality of FAMT&L-project, open discussion with school teachers by R. Velder and S. de Blauw	57,14%	28,57%	14,29%	0,00%	0,00%

Please give your score from 1 to 5 (5 being best) for each lecture (afternoon session).

	5	4	3	2	1
Assessment belief and Gender gap by C.Tomasetto	57,14%	42,68%	0,00%	0,00%	0,00%
Round table discussion	71,43%	28,57%	0,00%	0,00%	0,00%

Most of the lectures individually scored satisfactory or very satisfactory.