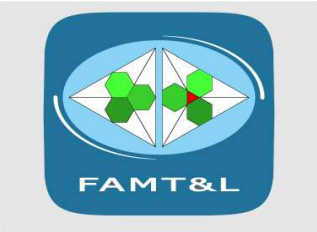

Formative assessment in mathematics for teaching and learning (FAMT&L)

Methodology Report (WP3)

Educational/learning needs analysis: practices of teaching and formative assessment of the mathematics' teachers

Due date of deliverable: 31/03/2014

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Introduction

The aims of this work package (WP3) are to make a focus on the practices of formative assessment of the mathematics' teachers; to gather information on training & learning needs of teachers; to collect and to analyze data on the formative assessment of the mathematics' teachers in the school contexts of the different partner countries involved.

The main 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. That means to provide standardized procedures for using the camera and standardized procedures for analyzing videos.

Tasks:

Synthesis of the practices' analysis: interview, questionnaire and videos data in real situation of mathematics teaching;

We organize a series of activities aimed on identifying examples of teaching and assessment practices (both positive and negative). Through video recording, these practices will be analyzed according to the method of microanalysis and will be particularly useful as a training tool for teachers.

Definition of common protocol of data collection;

With the support of the research works TIMSS (http://nces.ed.gov/timss/), we will define a common protocol, including:

- methodology of data collection;
- methodology of data analysis;
- methodology of data selection for training.

Definition of common protocol of data analysis;

This methodology of analysis will be focused on the competences analysis to be able to join it into the training curricula.

Selection and Indexation of data for construction of the web repository

First objective of the task consists in putting in parallel the speech of the interviews with the analysis of the actions in situations. The second objective is to have videos of situations to allow working on the reflexive action in life-long training. The third objective is to have

materials for the training: contents, videos in situation and teachers' feedback analysis.

This document sets out the methodology (theoretical framework and methodological guides) that we will use in the project.

1. Theoretical framework of the methodology

First developed in the United States, research on teacher practice resulted in many works. They have long been enrolled in a paradigm of "process - product" by identifying variable categories (Durand, 1996; Anderson, 1983; Brophy, 1983; Doyle, 1983, 1986; Crahay, 1989) that influence student learning but reducing the study of the teaching process only to observable behavior of the teacher. These studies were designed to determine the "effectiveness" of education (Walberg & Fowler, 1991) and are still present today with a consideration of the "performance" of pupils (TIMSS, 1995 and 1999).

Secondly, researchers have developed the cognitive models "thinking of teachers" (Shalvelson 1981; Tochon 1993) who studied the cognitive nature of education: preparations, planning and decision making affecting practices.

Thirdly, the "ecological" models have rehabilitated the importance of the "situation" (Bronfendrenner, 1986) or the instructional. Finally in last decade, interactionist and plural models (Robert, 1999; Rogalsky, 1999) have developed. They articulate several types of variables: the teacher, the learner and the "situation".

According to Beillerot (1998) “the practice, although they included the idea of the application, do not immediately return to how and gestures, but the methods to do. The practice is at once the rule action (technical, moral, religious) and the exercise or its implementation. This is the double dimension of the concept of practice that makes it valuable: on one hand, gestures, behaviors, languages; the other, through the rules, these are the objectives, strategies, ideologies which are invoked.”

In order to treat teachers’ practices, researchers have usually two methods: taking open notes (written notes, schemes, drawings) or the use of a coding grid, sometimes supplemented by copies of documents or a collection of objects created or used (Barron 2007). The problem is the number of constraints that occur during their use: the accuracy of the human eye, write speed when taking notes, the necessity of a long immersion in a population, reproducibility of data, elaboration of observation grids before observation and determination of categories.

The video is a great tool to try to appreciate the logic of action, as can be understand in the practices of the actor.

1.1. Methods for recording video in the classroom

Since the development of digital technologies and the extension of the video in the educational research field, different methodological practices to collect and to analyze data from video recordings have emerged.

Video recording equipment in classroom settings

The primary concern before starting to record practices on the classroom should be the choice of the video camera(s) and the positioning of the camera(s).

Veillard (2013) analyze some research works in order to make the statement of video data collection methods. The characteristics of the situations studied (lessons in the classroom, lectures, practical work, interviews with teachers and / or students, or preparatory meetings between teachers) limit the variety of devices. He lists and describes just four types of video-recording devices developed by researchers to film teaching situations.

The first technical solution (for recording the entire class) supposes two cameras (a first camera equipped with a wide-angle lens on a tripod in a top class area, with a wide static shot of the students and a second camera on a tripod in a corner in the back of the class with a static shot of the area around the table), a wireless lapel microphone worn by the teacher, one or more wireless lapel microphones worn by students to capture verbalizations in class (see the figure 1).

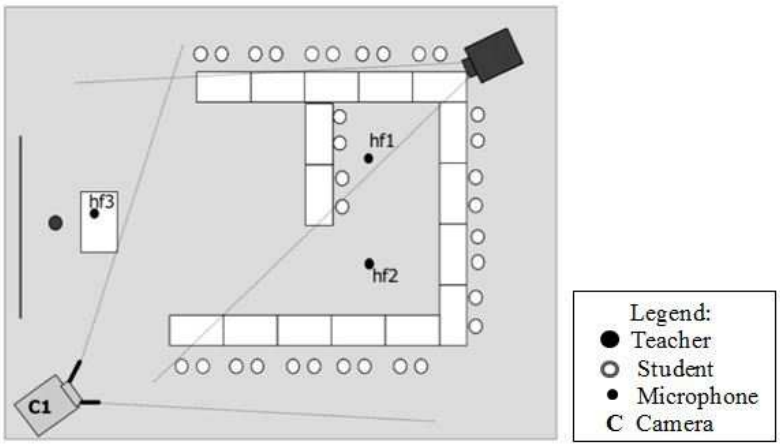

Fig. 1: Video device for recording the whole class

One version of this solution is presented in TIMSS project. The main idea in this project is to keep one static camera (on a tripod) and to use a second moving camera in two ways:

- On the tripod but by allowing framing changes during recording (for example: track the movements of the teacher, or some students
- On the shoulder which allow to follow certain actors or certain artifacts

A second solution is a binomial device. The equipment necessary in this case is composed by a camera on a tripod, with a static shot of the pair or small group of students studying with, in the background, depth of field on the immediate environment of the group; one or more wireless microphones to the students in this group; a wireless microphone on the teacher (see the figure 2).

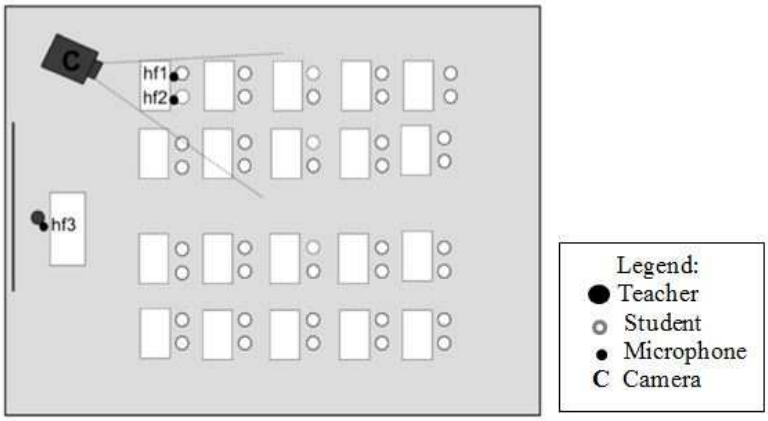

Fig. 2: Binomial video device

Another technical solution listed by Veillard (2013) is a mobile device for video recording adapted for kindergarten classes (as in French kindergarten classes) which are often divided into several areas where students are temporarily divided by type of activity. Because children are moving much from one to another zone, a camera up with wide static shot is usually not precise enough to capture what is happening in a given area. In this case, a second camera mobile, shoulder, will allow following the movements of children, including outside the class if the educational activity considered the leads to it (see figure 3).

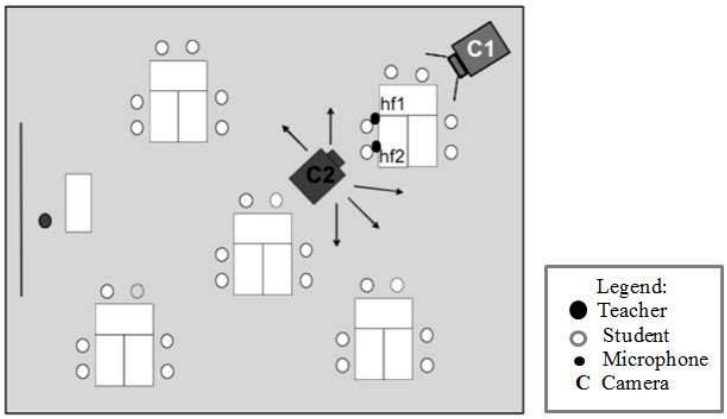

Fig. 3: Mobil video device

The last video recording device described by Veillard (2013) is a technical solution adopted for meetings or interviews (see figure 4). The equipment is smaller and much easier to dispose in the room. It is important to have a camera on a tripod, with a still shot of the players present at the table; a microphone wired room on the table or lapel microphones for actors. An additional camera can be installed above the vertical to film the materials used, handling and registration.

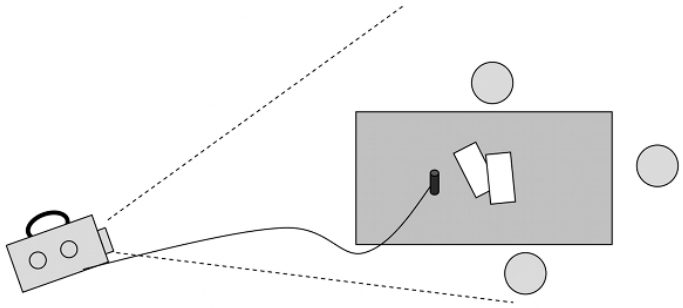

Fig. 4: Video device for meeting/interviews

To synthetize, there are four modes to use the camera (see table 1):

- Camera positioned on the tripod in static shot (no action on the camera which means no zoom, no movements) or in dynamic shoot (allowing zoom and movements in horizontal or vertical axis)
- Handheld camera (on the shoulder) without movements, zoom or with movements

and zoom

	Static shot	Dynamic shot
Camera on tripod	**No action** **No movements**	**Zoom** **Movements on horizontal and vertical axis**
Camera on shoulder	**No movements** **No zoom**	**Movements** **Zoom**

Table 1: Camera positions' modes

Kilburn (2014) presents three methods for producing video recording within classroom settings depending on needs to capture or not more than one camera angle, to have or not the video available for immediate play-back, to have or not mobile equipment.

A single camera recording is necessary if we not wish to capture more than one camera angle. In this case, Kilburn (2014) advise to place at the back of the classroom a HD digital camera with a wide lens angle for learners or an optical zoom for teacher. The teacher is the primary "subject" for the video recording. The camera may be positioned in front of the classroom to record students. In this situation, the teacher will be left out of the shot.

Another alternative is to use a multi-camera recording for editing later (see also Veillard, 2013) or a live capture from multiple cameras.

Advances in digital video technology will allow new methodological approaches or developments. The wireless connectivity allows video to be transferred or 'streamed' to a nearby device using a wireless ('Wi-Fi') network connection, reducing for example the need for obtrusive wires to be trailed around the classroom when undertaking a live capture recording

Smartphones and tablets are not only able to record video, but can also take advantage of the same sorts of wireless network connectivity discussed above to transfer video to other devices. In fact, software developed for Apple devices even allows multi-camera recording from

Smartphones or tablets connected to each other wirelessly.

Wearable cameras, with ongoing improvements in the video quality, usability, and cost of ultra-compact wearable cameras, are bound to see more widespread use in the classroom

Advantages and disadvantages of camera's types

The camera on the shoulder is undoubtedly the one that allows the most opportunities: static shot throughout the registration or change of plan, zoom and camera movement, ability to remain static or change its position to better access certain events or follow the actors. However, it is technically difficult to implement because it requires knowing precisely what we try to decide at any time to his position, framing and plan changes, relevance to zoom in on an item. In addition, it requires significant expertise in handling the camera for good quality images (stabilization of the camera, taking account of the light sources, anticipating noise conditions, etc.).

Hall (2007) is considering that "the job of a person operating a follow camera is to stay with the proxemic shape of the interacting group (i.e., bodies in relation to each other and things), ideally keeping everybody in that group within the visual frame as they move around. For example, a follow camera operator can attempt to have speaker and listeners in view as a speaker is making some point primarily with words. The reason for wanting to have the participants' faces and bodies in view as much as is possible is that analysts will want to determine what people orient to in conversation (where gaze is allocated, how bodies are coordinated with media, etc.). But when the speaker begins to open a document to point out what he or she is talking about, or begins writing on a white board or sheet of paper, the follow camera operator can begin alternating between zooming in close to get the artifact-level details and zooming back out to get speakers and listeners. As a way to capture aspects of context that are (presumably) available to study participants, zooming in and out of the scene is preferable to panning across speakers and media"(Hall, 2007, p.9-10).

The camera on tripod is probably more secure, especially when it remains fixed during the entire recording. Registering the class in a static shot wide and makes the open video for further analysis by other researchers. It is however not without drawbacks, especially if a player leaves the field, or if important information for the analysis remain inconspicuous (eg enrollments table).

Anyway, as we have seen in the types presented above devices, usually researchers combine several of them, using multiple cameras. This allows multiple viewing angles on the same object and the combination of a large and fixed plan and a more local and mobile plan. This is essential when the researcher wants to be able to capture many local scenes that take place in

parallel: for example, a discussion of the teacher with a small group of students while other exchanges occur farther between, on the other students.

1.2. Data organization

Leblanc, Ria and Veyrunes (2013) propose the construction of an interactively "electronic corpus" to organize data, heterogeneous and often very large, using a spreadsheet and hyperlinks to the direct opening of various documents. The digitization of video recordings on the computer can then be used to fix the collected data (such cuts that appear on the tapes), to hid parts of the image (blur faces or silhouettes if it lacks permissions to shoot some people), to mix different records (if two or more cameras are used, a record can be embedded in another) (Veillard and Coppé 2009), to move scenes or images.

1.3. Data Compression

Because of their size, original video files cannot be kept in this form on computers (for reasons of space on device storage and facilities to handle them). Compression operations are needed to reduce this size. The multiplicity of formats (.avi file type, .mov, .wmw, etc.), of video encoders (Sorenson codec type, mpeg1, mpeg2, mpeg4), of audio (mpeg3, AAC, etc.) and of multiple adjustable parameters (flow rate, image size, etc.) do not facilitate this operation. A compromise must be found between the quality of picture and sound required for analysis, the smallest possible size of the video to allow manipulation and easier transfers.

Here are many free or payable video converting applications (for example: Adapter, Compressor, Episode, Handbrake, Media Converter, MPEG Streamclip, etc).

1.4. Methods of video-recordings analyze (Data Reduction)

Veillard (2013) mention four methodological strategies used to perform the reduction of video data:

- **Observation strategy and systematic coding video recordings**

TIMSS Video Science (Roth. et al. 2006) is an example of one type of methodology for

the analysis of video recordings based primarily on coding categories. The objective of this project is to compare teaching practices in different countries (5 different countries: United States, Australia, Czech Republic, Japan and the Netherlands) and study their effects on learning. To ensure the solidity of this device in all national contexts where it was to be used, the researchers first looked for a strong consensus among the participants of these countries which was given by the use of the same codes.

"Descriptions for each code were developed collaboratively as the group watched and discussed video examples together. Science Code Development Team members then independently applied the proposed definitions to a new lesson(s). Afterwards, the group compared their independent coding decisions and used differences in opinion as a strategy for clarifying the written definitions and for reviewing the effectiveness of the proposed codes in capturing the desired lesson feature. This process of independent review of lessons followed by group review and consensus building continued until 85 percent or higher inter-rater agreement was reached by the Science Code Development Team members or until a decision was made to drop, revise, or create new codes" (Roth et al., 2006,p. 7).

The data reduction is performed by reference to conceptual categories developed by researchers. It consists, for coders, in searching the information flows, certain defined events or objects, which are indicators of the presence or manifestation of these categories, definition of the work of these indices and their application link with categories have already been created by the designers of the encoding device. The following analysis is quantitative and operates through statistical processing (descriptive statistics and cross-tabulations mainly).

- **Crossing strategies for various types of descriptions**

Recently, many studies in comparative didactics (Schubauer-Leoni & al. 2007 ; Sensevy 2007 ; Sensevy et Mercier 2007 ; Tiberghien et al. 2007) postulate the interest of articulating several types of descriptions of the video recordings.

On example is the thesis of Marlot (2008), based on the theory of joint action in didactics. The author favors a work by contrasted case studies. Two class sessions are filmed and analyzed. Video recordings are complemented by primary data associated: questionnaires and interviews with two teachers, pre- and post-test questionnaires for students. The data analysis process is operated in several successive stages which mobilize different modes of description video

recordings under different registers or genres of discourse (narrative, synoptic, categorical)

- **Progressive refinement strategy assumptions**

The methodology introduced by Engle, Conant and Greeno (2007) to study the role of discourse in conceptual learning is based on a method of data reduction operated by so-called progressive refinement strategy assumptions. This methodology is characterized by an intense use of video recordings at all stages of the analysis.

It is successively used for:

- select relevant passages for the object of study related to the research mentioned by a specific discussion topic;
- characterize the phenomena by which manifests the object studied;
- transcribe more finely selected passages;
- code these passages with conceptual categories; search for factors explaining the phenomena highlighted and construct theoretical assumptions;
- test and refine these assumptions on other types of discussions.

This methodology needs an efficient indexation system.

“Searching for episodes of this topic was feasible because we had made content logs of the video-tapes in our collection.” (Jordan & al., 1995).

“A content- log is written by someone watching a tape with only minimal reviewing in order to provide a time-indexed list of topics being discussed.” (Engle & al., 2007).

- **A collaborative strategy researcher / actor observed**

As part of the action current, the theoretical point of view is to account for the asymmetrical relationship of an actor with his environment: he built his own world in the course of the action by selecting its environmental elements. The researcher is primarily interested in the pre-reflective consciousness, that is to say what makes a sign to the actor in the situation, his concerns, and that on which he focuses during the action. The data reduction work is strongly guided by the views on the action and is based on a methodological protocol where class video data is only an insufficient step to access this object. The researcher must rebuild the own world of the actor which it is not direct accessible for him. The researcher does not operates alone data reduction but in cooperation with one or more actors.

1.5. Procedures and tools dedicated to the analysis

Procedures

The TIMSS video project is dominated by an explanatory logic: the aim is to highlight the relations of statistical correlations between on the one hand, class configurations, shapes and teaching content and secondly, learning opportunities, with efforts to develop a common and uniform coding system for all countries and to ensure the highest possible reproducibility of video encoding process, regardless of the cultural context.

Research conducted within the course of action is highly dominated by the understanding and focus on one or a few cases: it is about to focus on the perspective of the actor, on the meaning of the situation for him, on his own meanings.

Engel and colleagues highlight a real dialectic between comprehensive phases (search for video segments with a subject-specific discussion) and explanatory phases (analytical and comparative approach, using criteria and encodings, distribution speaking turns, quantification of overlapping, types and number of outdoor activities in the discussion).

Marlot uses the narrative register that refers to the idea of articulating interpretations and intentions of those events with more goals in the course of joint action. It also relies on a more explanatory language type analysis.

Some researchers follow the idea theorized by Lemke (2000) that the didactic or educational processes are located in complex systems that require multilevel analysis of temporal extension. This is of course the case of research that mobilizes type analysis scales as macro, meso, micro (Marlot, Tiberghien and Malkoun). Other research, however, do not distinguish between different levels of analysis (this is the case of Engle, as well as the TIMSS project).

Software

Tools have been created to help with the annotation and analysis of video recordings. A number of programs have been recently developed in different human sciences disciplines in order to facilitate the analysis of video recordings.

Clan was developed by Leonid Spektor, from the University of Carnegie Mellonest, especially for linguistic researchers.

Actogram Kronos was created in ergonomics by Alain Kerguelen from the laboratory

Work and Cognition at the University of Toulouse II (http://www.actogram.net)

Advene (Annotate Digital Video, Exchange on the Net) is software developed by the SILEX team (Supporting Interaction and Learning by Experience) LIRIS laboratory (Laboratory of Image Computing and Information Systems) from the University Claude Bernard Lyon I. It is specifically designed to annotate audiovisual documents and easily share hyper videos (http://advene.org).

Videograph was developed by Rolf Rimmele, IPN Kiel (Leibniz-Institut für die Pädagogik der Naturwissenschaften an der Universität Kiel) to facilitate analyzes conducted in the TIMSS video project (http://www.ipn.uni-kiel.de/aktuell/videograph/enhtmStart.htm)

Transana is being developed software research center on education from the University of Wisconsin-Madison (WCER) by David Woods. It is quite widely used in the field of education (http://www.transana.org)

Anvil, originally developed for gesture research in 2000, it is now being used in many research areas including human-computer interaction, linguistics, ethology, anthropology, psychotherapy, embodied agents, computer animation and oceanography (http://www.anvil-software.org/)

Other software: Observer XT, Coda

2. Methodological guide

Starting from the review of the literature presented in the "Theoretical framework of the methodology" section, we developed some guides for data collection and data analysis.

2.1. Data collect - Video guidelines

Each partner will produce some (10 or less) long videos in natural situations and in an organized situation of assessment in the classroom.

Each partner will extract from the long videos some short videos (involving episodes of assessment).

The short episodes should have a length of about 2-5 minutes.

Each country will upload onto the *ESPACE* platform:

- the long videos (the Mothers)
- a “x” number of short episodes (the little sons!)

EQUIPMENT

The equipment needed to make videos in the classroom is:

- 1 camera (wide angle lens)
- 1 pedestal
- 1 reception for the microphone
- 1 power strip

It is necessary to decide when we’ve to start the recording.

COMPRESS VIDEO

We will create a video in HD format (with the camera) and we need to compress it into an Mpeg4 file, in 2 formats:

- 320x240: format to be shared with the partners;
- 800x600: format for the video analysis.

To compress the video we could use the following program:

- *HandBrake*: for Mac, Windows and Linux

WHAT TO DO WITH A VIDEO

After recording a video you need:

1. To archive it in HD format (the original format for the camera);
2. To compress it into an Mpeg4 file, in 2 formats :

a. 320x240

b. 800x600 (or 1024x600)

3. to give a name to the video.

For each video, make a **FOLDER** ; each folder should contain:

1. The Video in HD;
2. The Video in Mpeg4 320x240;
3. The Video in MPeg4 800x600;

4. A Journal of the experimentation;
5. A file .spv created with iCODA .

HOW TO CONVERT VIDEOS

To convert videos you can use HANDRAKE; it's a Multi-Platform software (Windows, Mac and Linux) and an open source one. You can download the program from the following link

https://handbrake.fr/

To convert videos please follow the following instructions:

1- Click on "Source", then on "Open file" and select the video file that you want to convert;

2- Choose the "Destination": write the name you want to assign to the converted file, click on "Browser" and choose the folder where you want to store the video that HandBrake creates.

3- In "Output setting" – "Container" choose the option: **MP4 Files**

4- In "Output setting" – "Picture" – "Size" you can find a box naming "Width". This box allows you to control the pixel resolution of the encoded video.

In the box "Width" You have to write:

- 320 if you want to convert your video with the resolution 320x240
- 800 if you want to convert your video with the resolution 800x600.

5- Click on "Start" to initiate the conversion of the video

The HandBrake guide is available at the following link:

https://trac.handbrake.fr/wiki/HandBrakeGuide

2.2. Data analysis

2.2.1. Construction of the meta-name/keyword structure

Step 1- METADATATION OF THE LONG VIDEO:

- Video's identification code;
- Country;

- Language;

- Type: audio/video (length, format);

- Creation date;

- Author (University);

- School level target;

- Number of pupils in classroom.

Step 2- EXTRACT A NUMBER "x" OF THE SHORT VIDEOS ABOUT ASSESSMENT SITUATIONS:

- SHORT video: "extract by long video n. (ID code) + CODE-NUMBER"

2.2.2. Construction of the indexation grid of the activity in situation

1. MATHEMATICS CONTENTS	2.TIME OF ASSESSMENT	3.TOOLS/STRATEGIES	4.PHASES OF ASSESSMENT
1. escribe the main content which was programmed **a. CONTENTS** - Numbers - Spaces and shape - Uncertainty and data - Relations and functions **b. CAPABILITIES** - Communication - Mathematising - Representation - Reasoning and argumentation - Devising strategies for solving problems - Using symbolic, formal and technical language and operations	Say if the assessment period comes before, during or after the teaching moment: 1. Ex ante 2. In itinere 3. Ex post	1. Use of objective tests: a) Multiple Choice b) True/False c) Correspondences d) Cloze 2. Use of open or semi formalized strategies of assessment 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	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)

MICRO-ANALYSIS: each Country conducts a micro-analysis of each short episode

Grid of observation with indicators and descriptors

0. Additional observations about the Climate in the classroom	**1. CONTENTS OF MATHEMATICS**	**2.TIME OF ASSESSMENT**	**3.TOOLS/STRATEGIES**	**4.PHASES**
Global perception about teacher and student attitudes, ...	1. Describe the main content which was programmed 2. Describe a second content which wasn't programmed **a. CONTENTS**	FA is being done before, during or after the time at which a topic is discussed 1. Ex ante 2. In itinere 3. Ex post	1. Use of objective tests: a) Multiple Choice b) True/False c) Correspondences d) Cloze Multiple 2. Use of open or semiformalized strategies	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) INDICATORS (these are only examples!)

	- Numbers - Spaces and shape - Uncertainty and data - Relations and functions **b. CAPABILITIES** - Communication - Mathematising - Representation - Reasoning and argumentation - Devising strategies for solving problems		of assessment 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 Process of student's activity g) Discussion /questioning in the classroom	**1. Presentation of the tests/trials** **1.1.- Sharing the correction and/or assessment criteria with the class** – The teacher fixes with the students the date for the test – The teacher reminds the class that today is the day of the test – The teacher shows to the students the aims of the test – The teacher asks some questions to the students to verify if the students understood the aims of the test – The teacher shows with the students the subject of the test – The teacher shows with the students the criteria to correct the test – The teacher explains the way the test has to be done – The teacher asks some questions to the students to verify that the students understood the way the tests has to be done – The teacher recalls the criteria to correct the test – The teacher discusses with the students about the above criteria – The teacher keeps care the student's observation about the criteria – The teacher makes clear, for a written test, the ranking for each question.

	- Use of symbolic, formal and technical language and operations			**2. Administration of the tests/trials** **2.1.- Delivery of written tests** – The teacher distributes the text of the test – The teacher passes among the students smiling at them – The teacher watches to avoid cheating – The teacher gives additional activities to students who completed the test before time – The teacher answers to questions about the test during the work – The teacher doesn't answer to questions about the test during the work – The teachers allows the students to collaborate among them during the test – The teacher provides advices or suggestion during the test – The teacher allows the students to talk to each other during the test – The teacher makes sure that the student cannot collaborate during the test

				– The teacher makes clear to the students that they will be watched during the test – The teacher gives enough time so that every student can work through the test (without anxiety) **2.2- Oral tests or group work** – The teacher gives individual work to be done – The teacher gives work to be done in couples – The teacher gives work to be done in groups – The teacher ask questions to the whole class – The teacher ask questions to a single student – The teacher ask “rhetorical questions” to the whole class – The teacher ask “rhetorical questions” to a single student – The teacher asks a new question based on the correct answer to the previous one – The teacher asks a new question based on a wrong answer to the previous one – The teacher asks a new question based on the previous one – The teacher “moves” the question from one student to another – One or more students take part n the answer given by another student

				– One or more students ask to intervene about the answer given by another student **3. Recording data on student performances** – The teacher uses a narrative tool of observation – The teacher uses a structured tool of observation – The teacher takes some record of the behavior of one/all student/s – The teacher takes some record about how much the students have achieved to handle the content of the test – The teacher takes records from her/his desk – The teacher takes records passing among the students – The teacher urges for care and attention in the work for the test **4. Giving back the results** – The teacher illustrates the results of the test to the whole class – The teacher illustrates the results of the test to groups – The teacher illustrates the results of the test to each student – The teacher gives back the results in a short time – The teacher describes the mistakes as an occasion to learn

				– The teacher points out the mistakes of the single student in a stigmatizing way – The teacher talks with calm and patience about the mistakes done – The teacher discusses the mistakes stimulating the whole class to take part in the debate – The teacher generates collaboration among the students – The teacher stresses the fact that the most difficult contents will be treated again – The teacher avoids to use marks or other kind of judgments – The teacher stimulates the students with best results to help the ones that have had problems in the test – The teacher illustrates the best results obtained in the test – The teacher takes care not to stress the difference between high and low marks – The teacher delivers the results passing among the pupils' desks – The teacher calls each student to deliver them the results – The teacher calls each student and spares a few minutes to comment privately his/her results – The teacher delivers the results while the class is busy with other activities

				– The teacher stresses his/her disappointment for the low marks she/he had to give. – The teacher makes negative comments on the students who failed the test – The teacher makes positive comments on the students who passed the test – The teacher uses the summative results to create an occasion of formative assessment **- Giving back the results for written tests: The teacher corrects the test in the classroom.** – The teacher corrects the test analytically, showing the right way to do it and explaining the possible mistakes – The teacher has the student who passed the test explain the correct way to do it (at the blackboard or from their seat) – The teacher has the student who failed the test explain the correct way to do it (at the blackboard or from their seat) – The teacher takes care to write a detailed comment on the work of any student – The teacher uses scores to value the test (not giving marks) – The teacher has the student do the corrections among themselves (cross-correction)

				– The teacher has every student to correct his/her own test **- Giving back the results for oral tests:** – The teacher analyzes the data s/he collected in the classroom – The teacher writes a profile of every student's results – The teacher writes the profiles with respect to knolwedge – The teacher writes the profiles with respect to skills – The teacher uses scores to value the test (not giving marks)

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