



# **FAMT&L**

## **FORMATIVE ASSESSMENT IN MATHEMATICS FOR TEACHING AND LEARNING**

*Work Package 3 - Educational/learning needs analysis: practices of teaching and formative assessment of the mathematics' teachers*

### **Deliverable D3.2– Data collection**

Start date of project: 01/12/2013

Duration: 36 months

Lead organisation for this deliverable: **University of Cergy-Pontoise (UCP)**

<b>Deliverable number</b>	D3.2		
<b>Title</b>	Data collection		
<b>Type of outputs / products / results</b>	Data collection base		
<b>Delivery date</b>	M9 (June 2014)	<b>Dissemination level</b>	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Restricted to other programme participants (including Commission services and project reviewers) <input type="checkbox"/> Confidential, only for members of the consortium (including EACEA and Commission services and project reviewers)
<b>Nature</b>	<input type="checkbox"/> Report <input type="checkbox"/> Service / Product <input type="checkbox"/> Demonstrator / Prototype <input type="checkbox"/> Event <input checked="" type="checkbox"/> Other – Data and information		
<b>Language versions</b>	PARTNER LANGUAGES : EN, IT, GR, FR, DU		
<b>Target languages</b>	EN		
<b>Description</b> (limit 1000 characters)			
The database built by means of the collected data allows investigating several fields of analyses: disciplinary, behavioral, didactic, professional practices.			

*The FAMT&L (Formative Assessment in Mathematics for Teaching and Learning) project has been funded under the Lifelong Learning program. This publication reflects the views only of the author(s), and the Commission cannot be held responsible for any use that may be made of the information contained therein*

## Table of content

1. 3.2 Data collection -videos .....	6
Introduction 3.2.....	6
Problematic .....	8
Developing a catalog have three challenges:.....	8
1. What technology will support the catalog to enable: indexing, archiving, distribution and requests? .....	8
2. What types of request will be cataloged: DublinCore example ( <a href="http://dublincore.org">http://dublincore.org</a> ) .....	8
3. What will be the purpose of this catalog: passive or active interrogation archiving and operating live? .....	8
The first challenge that the consortium had to solve and therefore to answer these three questions. Naturally, it was decided to index the video clips based on the analysis grid. As the project was to continue with a training phase equipped with extracts videos, then this is not a passive storage, but it is an interactive tool that must be put in place. Finally, from the perspective of technology, the choice was made to meet the standards and operate free tools. The choice fell on Omeka: <a href="https://omeka.org">https://omeka.org</a> .....	8
Data creation method, indexing and establishment of the catalog of extracts videos.....	8
Creating Data .....	8
It is a complete set of data that is aggregated for this project: .....	8
• a questionnaire to assess the performances of in-service teachers on the concept of formative assessment; .....	8
• responses of teachers questionnaire in each participating country; .....	8
• sound recordings and videos of authentic teaching situations;.....	8
• an indexing grid of sound and video recordings;.....	8
• indexed sequences; .....	8
• analysis analyzes of output files;.....	8
• a method of selecting sequences of training for novice teachers; .....	8
• training course for new teachers; .....	9
• pathways analysis.....	9

This chapter discusses the method for indexing an event from a video corpus. To ensure the reproducibility of the method, we conduct a four-part analysis: ..... 9

1. macro-analysis of all of the recorded footage to help identify formative assessment passages..... 9

Example: Video France, formative assessment phase ..... 9

Macro-Video-1 Analysis - Teacher, Daguerre College Shooting 14 September 2015, 6th, Teaching hours: 8 am to 9:05..... 9

Macro place of classroom activity:(R4) ..... 9

2.Bibliography..... 18

# 1 Data collection - videos

## 1.1 Introduction 3.2

The work package number 3 aims to:

- make a focus on the practices of formative assessment of the mathematics' teachers;
- gather information on training & learning needs of teachers;
- collection and analysis of data on the formative assessment of the mathematics' teachers in the school contexts of the different partner countries involved.

To achieve these aims, the work package will include the following tasks:

1. Synthesis of the practices' analysis: interview, questionnaire and videos data in real situation of mathematics teaching;
2. Definition of common protocol of data collection, analysis and selection of data for the training course;
3. Definition of common protocol of data analysis;
4. Selection and Indexation of data for construction of the web repository.

For the **collection** of videos each Partner conducted some section of videorecording of situations of teaching and learning in classroom. For this they organized a series of activities aimed at identifying examples of teaching and assessment practices (both positive and negative). These practices, through video recording, will be analysed according to the method of microanalysis and will be particularly useful as a training tool for teachers.

The video files collected are **archived** in digital supports (Hard Disk or server) by each partner. The video files are too large to be included in the Dropbox folder. The video has to be analyzed and used to obtain a number of short videos to be archived in the web repository and to be used for supporting the teacher training course.

For the video **analysis** the consortium created a common protocol and a grid (see the deliverable 3.1). To support the analysis and the metadatation of video (long and short) files it was also chosen software between the various usable.

Using a software has advantages and disadvantages that we mention here.

The advantages are :

1. The software output file allows several arithmetic and statistical treatments allowing a comparison between the events on the same basis;

2. The durations of the events are taken into account. We refer to current research using the chronogenesis, topogenesis and mésogénèse, Sensevy example, 2001, Theories of action and action of the teacher)

The disadvantages are:

1. Current market software have been developed for our research and therefore it will be necessary to adapt the method or indicators. Few software can perform this type of work. There are best known Noldus (<http://www.noldus.com>) Videograph (<http://www.dervideograph.de/enhtmStart.html>) Actogram (made from a research program on the analysis of spaces and conflicts within the framework of the improvement of working conditions), ANVIL (to allow indexing time event with a duration from a video) or for sport: <https://www.kinovea.org>, ICODA (<https://vosaic.com/products>)

2. Learning time of such tools and efficiency. Somehow, reports between the time invested and the result. It can be very long to learn how to use this type of software in the end to only use the indexing feature that can be done with a simple spreadsheet.

A first work was done with the software ANVIL (<http://www.anvil-software.org>). He repeated many of the criteria used by the consortium, namely:

- free;
- multiplatform: OSX, Linux and Windows;
- that supports multiple formats video so non proprietary compression codecs;

- that allows annotation of several groups and units for clusters and crosses;
- exporting the annotation file in CSV format for a second arithmetic and mathematical treatment.

This work was very expensive and operation of the data produced has not convinced the consortium. For 45 minutes of video, it took nearly 12 index, of annotation with nearly 20 video passages. The operation of the output file was not significant.

This part of the document will address the issue of how to collect data and how to catalog. This cataloging issue is essential for the project because it allows terms to exploit the project's video corpus and be a first video data bank of authentic professional gestures on formative assessment.

## 1.2 Problematic

Developing a catalog have three challenges:

1. What technology will support the catalog to enable: indexing, archiving, distribution and requests?
2. What types of request will be cataloged: DublinCore example (<http://dublincore.org>)
3. What will be the purpose of this catalog: passive or active interrogation archiving and operating live?

The first challenge that the consortium had to solve and therefore to answer these three questions. Naturally, it was decided to index the video clips based on the analysis grid. As the project was to continue with a training phase equipped with extracts videos, then this is not a passive storage, but it is an interactive tool that must be put in place. Finally, from the perspective of technology, the choice was made to meet the standards and operate free tools. The choice fell on Omeka: <https://omeka.org>

## 1.3 Data creation method, indexing and establishment of the catalog of extracts videos.

### 1.3.1 Creating Data

It is a complete set of data that is aggregated for this project:

- a questionnaire to assess the performances of in-service teachers on the concept of formative assessment;
- responses of teachers questionnaire in each participating country;
- sound recordings and videos of authentic teaching situations;
- an indexing grid of sound and video recordings;
- indexed sequences;
- analysis analyzes of output files;
- a method of selecting sequences of training for novice teachers;
- training course for new teachers;
- pathways analysis.

This chapter discusses the method for indexing an event from a video corpus. To ensure the reproducibility of the method, we conduct a four-part analysis:

1. macro-analysis of all of the recorded footage to help identify formative assessment passages.

Example: Video France, formative assessment phase

Macro-Video-1 Analysis - Teacher, Daguerre College Shooting 14 September 2015, 6th, Teaching hours: 8 am to 9:05

Macro place of classroom activity:

Time	Content	Comment
00 :00=>00 :02	Instructions: students take their notebook exercises, recalling the exercises numbers, recalling the name of the software to read a pdf, which student goes to the blackboard?  Students raise their hands, one designated student, one student goes to the blackboard and corrects the exercise, teacher asks the class if they agree, the teacher asks who wants to go to the blackboard following the exercise	They use the video-projector to do the correction
00 :02=>00 :04	Teacher sends a student to the blackboard while this teacher walks in the class ranks, he looks at the books of students, one student corrects the exercise in the blackboard, the teacher asks the class if they agree, the teacher asks who wants to go to the blackboard to correct the following exercises, the teacher sends a student to the blackboard, teacher holds the graduated ruler because the segment or line tracing has its first high point on the board, the teacher asks the students to raise their hands, the teachers calls on one student, "student gives an answer, teacher asks « why », the student gives justification, the teacher asks the student questions " any difference between a straight line and a segment, students in the class raise their hands	



00 :04=>00 :06	Teacher recalls "the last time we said that," the students raise their hands, the teacher gives some definition, the teacher asks some questions at the blackboard, he gives the correct answer, the correction continues, the students raise hand, the teacher asks who wants to go to the blackboard to correct the following exercises, the teacher sends a student to blackboard, the teacher holds the graduated ruler for tracing the segment or line (because of its first high point on the board), the teacher asks the class if they agree with the student's answer, the student gives an answer, teacher asks a question, students raise their hands, student gives an answer, teacher raises their hands, a student answers, and other students raised their hands.	
00 :06=>00 :08	The teacher asks another student, the student gives the right answer, the teacher validates, the teacher teaches the lesson  Next exercise, the teacher reads the instruction, one student raises his hand, teacher sends the student to do the correction of the exercise, from the student's answer, the teacher gives the right answer, and he asks the class if they are all agreed	
00 :08=>00 :10	Teacher asks a student to do the correction of the next exercise, the teacher asks questions to the student at the blackboard,  Teacher refers a student for the last two exercises, the teacher talks with the student about the right answer at the blackboard, the teacher asks the student to show him a segment, the student then corrects the exercise, a new request from the teacher about the straight line	
00 :10=>00 :12	Teacher asks the class if they are all agreed  Oral Question, few raised hands, the teacher asks a student, a student gives an answer, teacher resumes the set, teacher gives the answer, teacher designates another student, student gives an answer, teacher gives the correction, last oral waiting matter, teacher asks a student, student gives an answer, the teacher validates the teacher asks a question, teacher takes over again and wrote on the board the right answer, another question for the student,	
00 :12=>00 :14	The student gives an answer, teacher asks a question, student gives an answer, teacher asks another question, continuous interaction between teacher and student, validation request to the class, not back, question to the class, student gives an answer, the class validation request, 1 yes question to the class, student gives an answer, teacher designates another student, another student gives the correct answer, teacher resumes, he asks a new question, a student gives the correct answer, the teacher request validation of the class, teacher resumes and shows	
00 :14=>00 :16	Back to the lesson notebook	End of FAMTL

To select a sequence, we recall the definition of the project:

- The FA is an integral part of the teaching and learning process that contributes to its regulation;
- allows teachers to identify weaknesses and strengths of each student, in order to reflect on their practices and adapt them to match better with the final goal of student learning;

- establishes a dialogue between the teacher and student, with positive feedback on educational interventions to be undertaken to facilitate learning, in its form of formative feedback;
- promotes teaching and differentiated learning allowing each student to learn at his own pace;
- involves the student in analyzing their own mistakes / weaknesses and encourages self-assessment and peer review, ensuring the active involvement in the teaching-learning process;

Provides information and feedback on:

- the different components of learning mathematics students (conceptual, procedural, semantic, communication, problem solving, misconceptions, etc.)
- beliefs and representations of students towards mathematics,
- their behavior and interactions when they have to work on mathematical content,
- the choice of teachers (choice of content and methods, etc.)

Bibliography: Black & William, 1998; Sadler, 1998; Gagatsis, 2000; Nicol & Macfarlane-Dick, 2004; Black & Wiliam, 2006; Hattie, 2009; Looney, 2011; Cauley & McMillan, 2010

Reminder of the project objective: Implementation of a pilot training in the concept and implementation of formative assessment in a view to a better understanding of the scientific process.

The framework of the training:

- Training to achieve using more resources including a preferred use => video
- training of new teachers and initial teacher training;
- provide guidance and benchmarks for teachers trained to implement and regulate a specific event in the teaching and learning process here: a formative evaluation time.