

# Connected classroom technology to promote formative assessment in mathematics: FaSMEd in Italy

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## THE FASMED PROJECT IN ITALY: THE CONTEXT



**25** teachers from **three clusters** of schools:

- Istituto Comprensivo di Vinovo (TO)
- Circolo Salgari di Torino
- Istituto Comprensivo di Carcare (SV)

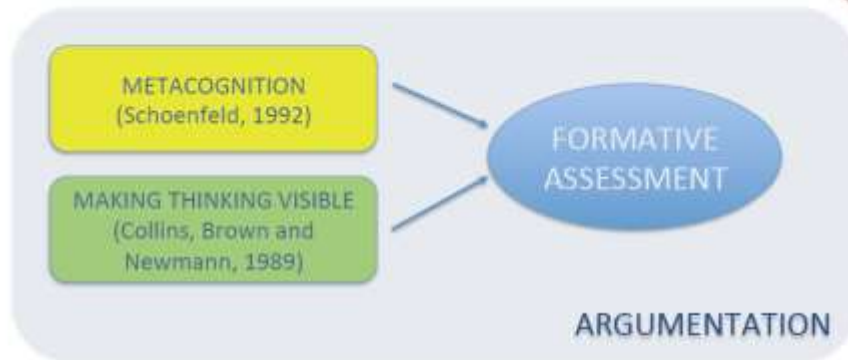
- **Primary** (grades 4-5) and **Lower secondary** (grades 6-7) schools.
- **Mixed ability** classes

From 5 to 14  
lessons  
for each class



About **450 hours** of teaching  
experiments in the periods April-  
May 2015  
and October-December 2015

## THE FASMED PROJECT IN ITALY: KEY-ASPECTS OF OUR METHODOLOGY



FOCUS ON ACTIVITIES AIMED AT PROMOTING  
THE SHARING OF STUDENTS' PROCESSES,  
PRODUCTIONS AND REFLECTIONS

## THE FASMED PROJECT IN ITALY: CHOICE OF THE TECHNOLOGY



### Connected classroom technology



- Tablets** for the students, who work in **pairs or groups of three**
- Computers** for the teachers
- Interactive whiteboard** or **data projector**.

It enables to:

- show (to one or more students) the teacher's screen and also the students' screens;
- distribute documents to students and to collect documents from the students' tablets;
- create instant polls and to immediately show their results to the whole class.



## THE FASMED PROJECT IN ITALY: CONTENTS AND ACTIVITIES



**Content:** Early Algebra

*Focus on Relations, Functions and their different representations*



**Adaptation of activities from:**

- the ArAl Units  **ArAl**
- the Toolkit activity  
"Interpreting distance-time graphs"

Three main **categories**  
of *different worksheets*:

- (1) PROBLEM WORKSHEETS
- (2) HELPING WORKSHEETS
- (3) POLL WORKSHEETS



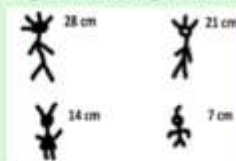
## THE FASMED PROJECT IN ITALY: THE DIGITAL WORKSHEETS



**PROBLEM WORKSHEETS**  
worksheets introducing a  
problem and asking one or  
more questions

### "The archaeologist Giancarlo"

On the ArAl mountain, in the middle of the desert, the archaeologist Giancarlo has found some graffiti engraved on the rock. He reproduced the incisions on his notebook, writing their heights. This is the page where Giancarlo reproduced the incisions:



Giancarlo's collaborators discuss a lot on the relation hidden in the graffiti.

Nicola says: "You can find the height of an incision only if you multiply 7 by the number of the tips on its head".

Battista concludes: "It is evident that, dividing the height of the incisions by 7, you can find the number of tips".

And Paolo: "What are you saying? The number of tips is the result of the division of the height by 7!".

- (1) What do you think about Nicola, Battista and Paolo's statements?  
Do you agree with them? Explain why.



## THE FASMED PROJECT IN ITALY: THE DIGITAL WORKSHEETS



### HELPING WORKSHEETS

aimed at supporting students  
who meet difficulties with  
the problem worksheets

#### "The archaeologist Giancarlo"

Martijn's classmates have drawn other incisions, constructing them referring to a different relation between the number of tips on the heads of the incisions and their heights. This is the graph they have constructed:

- 1) What is the relation between the numbers of tips and the heights of the incisions drawn by Martijn's classmates?

- 2) Represent the relation also through a symbolic expression to be sent to Martijn's classmates to show them what you have observed.



#### HELP:

Let's use the following table to collect all these information (complete it!):

$n=2$   $k=7$

$n=3$   $k=$

$n=$   $k=$

$n=$   $k=$

What is the relation between the number of tips on the head of one incision ( $n$ ) and the height of the same incision ( $k$ )?

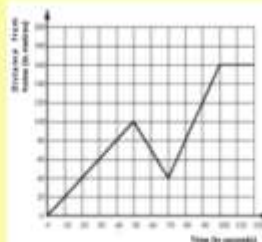
## THE FASMED PROJECT IN ITALY: THE DIGITAL WORKSHEETS



### POLL WORKSHEETS

worksheets prompting  
a poll between  
proposed options

Every morning Tommaso walks along a straight road from his home to a bus stop, a distance of 160 meters. The graph shows his journey on one particular day.



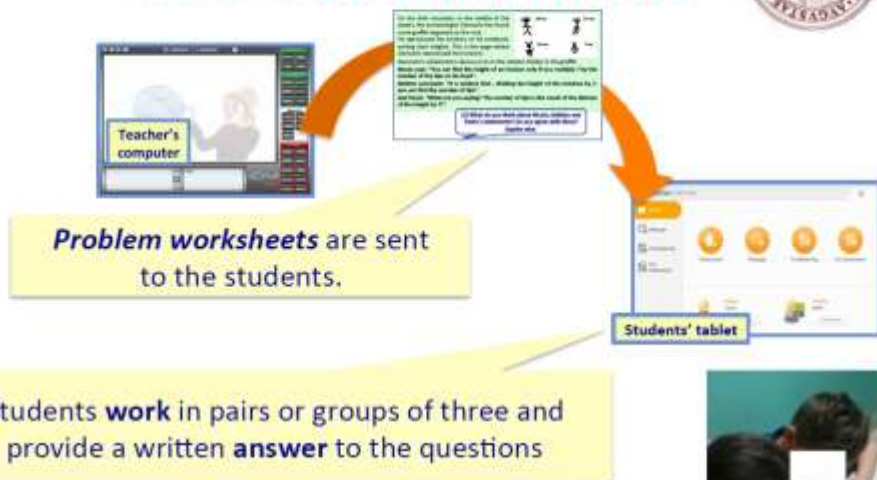
- (1) What happens in the period of time between 50s and 70s? How do you know it?

What is the correct answer?

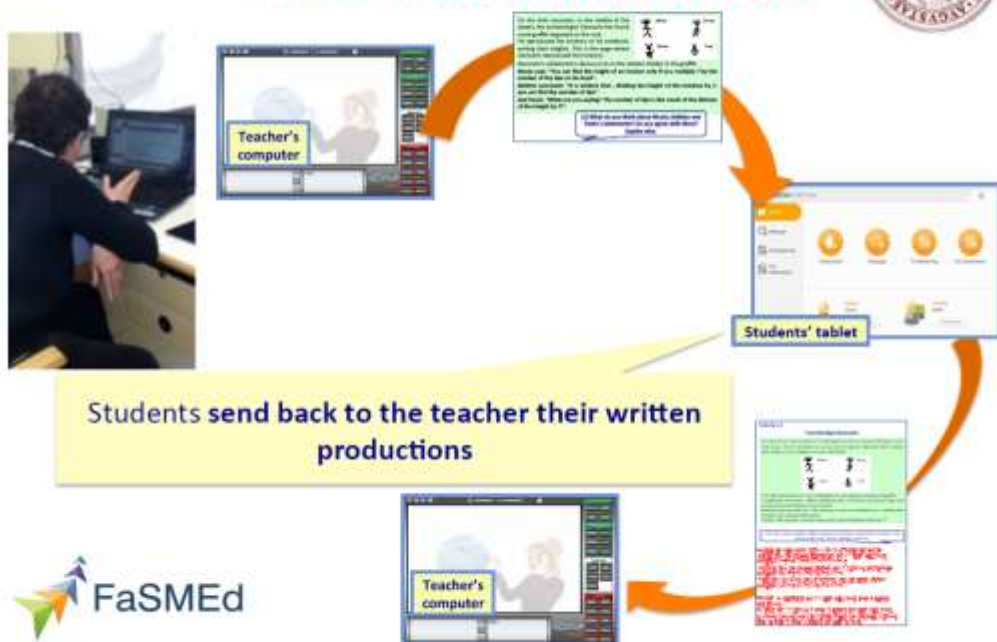
- (a) In the period from 50s to 70s, Tommaso comes back.
- (b) In the period from 50s to 70s, Tommaso changes his road.
- (c) In the period from 50s to 70s, the road, on which Tommaso is walking, goes down.



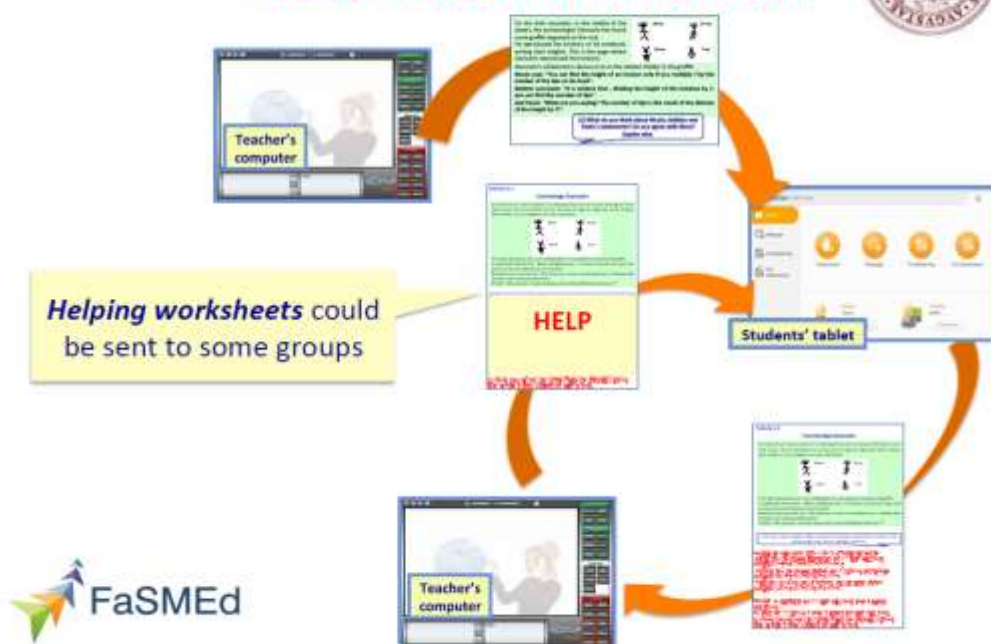
## THE FASMED PROJECT IN ITALY: TYPICAL STRUCTURE OF A LESSON



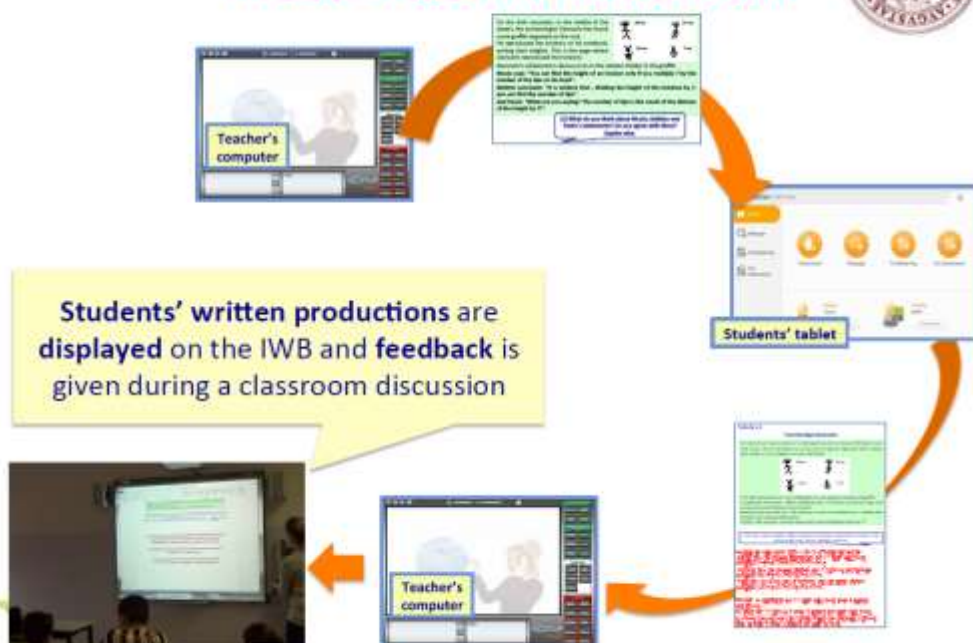
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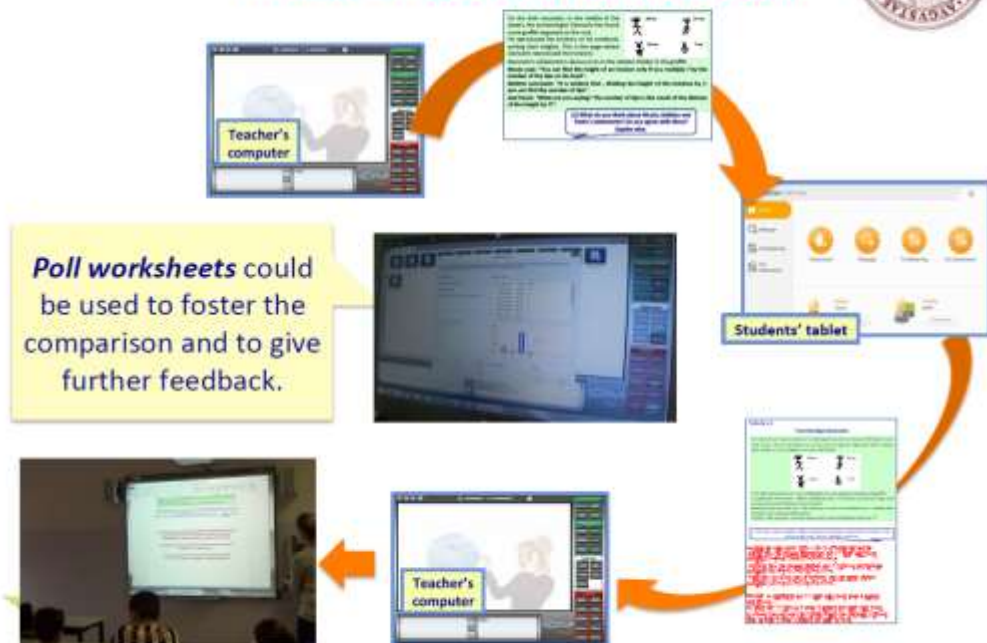
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## THE FASMED PROJECT IN ITALY: OUR RESULTS



### ➤ Evolution and refinement of the classroom methodology

Validation and refinement  
of the **digital worksheets**

Increasing and more systemic  
use of **instant polls**

Increased attention to using  
the **helping worksheets**  
at a meta-cognitive level

## THE FASMED PROJECT IN ITALY: OUR RESULTS



### ➤ Evolution and refinement of the classroom methodology: FOCUS OF CLASSROOM DISCUSSIONS

**Difficulties** as a starting  
point of FA

Criteria for the **choice** of  
students' productions to show

Criteria for **assessing argumentation**  
(correctness, clearness, completeness)

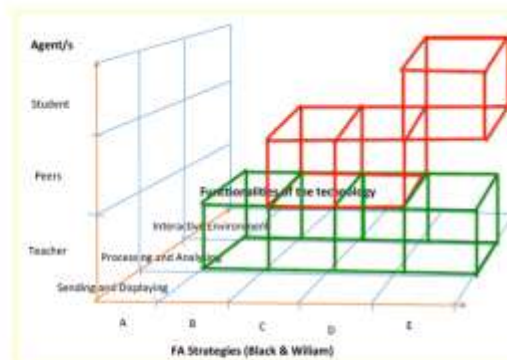


## THE FASMED PROJECT IN ITALY: OUR RESULTS



### ➤ The theoretical tools for the analysis

Use of the **FaSMEd**  
**tridimensional framework**  
and integration  
with **further lenses**  
(Hattie & Temperley's levels  
of feedbacks)





## THE FASMED PROJECT IN ITALY: OUR RESULTS



### ➤ Towards the elaboration of theoretical elements

- Analysis of the **role of the teacher** and of her **strategies of feedbacks**;
- Identification of **sub-levels of feedback**, with a specific focus on the **mathematics** at stake;
- Analysis of the role played by **digital worksheets** in the activation of FA strategies;
- Analysis of the dynamics that characterise the **interplay between different FA strategies**.



# Thank you!

