

**4th strategic seminar, EdReNe
Barcelona, March 2010**



Motivating young people to study MST: *the role of digital learning resources*

Dr. Àgueda Gras-Velázquez
26/03/2010



<http://inspire.eun.org>

This project has been funded with support from the European Commission.

This document reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



European Schoolnet

**Network of 31 Ministries
of Education in Europe**

**Support schools in
bringing about the best
use
of technology in learning**

**Promote the European
dimension in schools
and education**

**Improve and raise
the quality of education
in Europe**

EUN and ICT / MST projects



Inspire



bm:uk

Bundesministerium für
Unterricht, Kunst und Kultur

Thilm

ITC

EDU

CONSULT



Inspire (Innovative Science Pedagogy in Research and Education).

Purpose: challenge the lack of interest of students to start scientific studies and more widely to extend the supply of scientific specialists and develop a scientific culture in European countries.

During 10 months Inspire gathered data to:

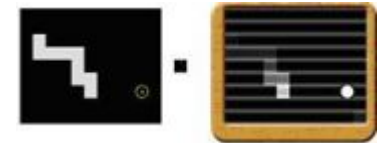
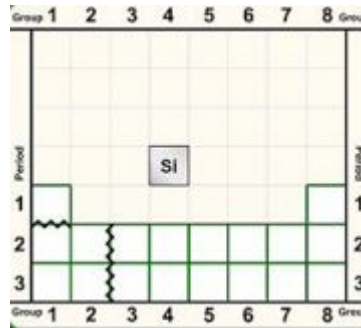
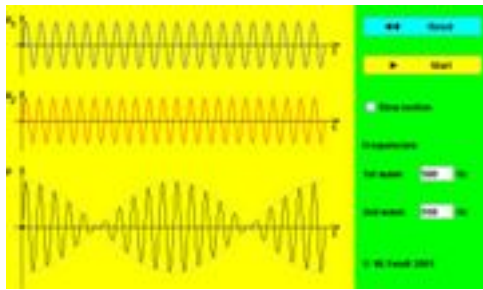
- **Observe** the impact of these new teaching methods on pupils and on their motivation.
- **Analyse** the pre-requisites to be defined for enabling teachers to integrate these new techniques in their pedagogy.
- **Identify** the critical success factors to be mastered at teacher and school level for the generalization of such practices.

December 2007 – November 2009

Inspire



LR = digital learning resources

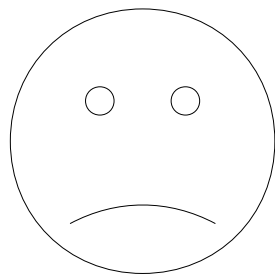


Pea Experiment

PARENTS:			
	yy rr	YY RR	
CHILDREN:			
yy rR	yy rR	yy rR	yy rR
○ ○	○ ○	○ ○	○ ○

Excel

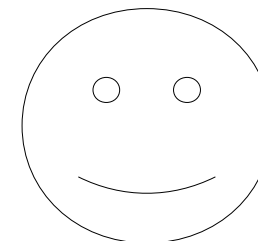
Inspire



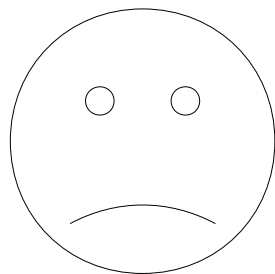
+

LR

=

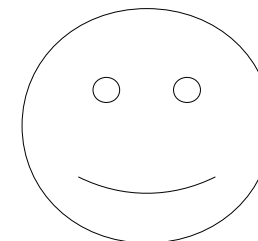


Inspire



+

LR



Inspire



+

LR

?



Inspire methodology



<http://inspire.eun.org>

ca.inspire.eun.org

es.inspire.eun.org

it.inspire.eun.org

de.inspire.eun.org

lt.inspire.eun.org

62 schools
5 countries
5 languages

Forms and deadlines table

Form	Due Date	Number of times repeated	Form (PDF)	Link
1. Form to be filled in by the INSPIRE COORDINATION				
Form 1.1: Administrative information	At the beginning of the project (by end of Oct)	1 per school		
Form 1.2: The motivation for joining	At the end of the project (by end of May)	1 per school		
Form 1.3: Evaluation of the project	At the end of the project (by end of May)	1 per school		
2. Form to be filled in by the MST TEACHERS				
Form 2.1: Explanation of the project report for the teacher	At the beginning of the project (by end of Oct)	1 per teacher		
Form 2.2: Day-to-day activities of the project	At the end of the project (by end of May)	1 per teacher/technique used		
Form 2.3: Description of the possible future activities	At the end of the project (by end of May)	1 per teacher/technique used		
Form 2.4: Evaluation of the possible future activities	At the end of the project (by end of May)	1 per teacher		
Form 2.5: Evaluation of the impact on the students	At the end of the project (by end of May)	1 per teacher		
Form 2.6: Impact on the environment	At the end of the project (by end of May)	1 per teacher		
Form 2.7: Questionnaire (Monitoring by the INSPIRE COORDINATION)	At the end of the project (by end of May)	1 per teacher		
Form 2.8: Questionnaire (Monitoring by the INSPIRE COORDINATION)	At the end of the project (by end of May)	1 per teacher		
3. Form to be filled in by the PUPILS				
Form 3.1: Questionnaire (Monitoring by the INSPIRE COORDINATION)	At the beginning of the project (by end of Oct)	1 per student		
Form 3.2: Questionnaire (Monitoring by the INSPIRE COORDINATION)	At the end of the project (by end of May)	1 per student		

questionnaires

Subject	Age	Subcategory	LO number	Title			
Physics	5 - 12	Kinematics	P1-5-1	Distance-displacement			
		Kinematics	P2-5-2	Motion with constant acceleration			
		Sound	P3-5-3	Changing sounds			
		Dynamics	P4-5-4	Conservation of Energy			
	13 - 16	Electricity	P1-13-6	Ohm's law			
		Optics	P2-13-6	Reflection			
		Mechanics	P3-13-7	Galilean relativity			
		Nuclear Physics	P4-13-8	Radioactive decay			
	17 - 21	Oscillations	P1-17-2	Beats			
		Dynamics	P2-17-2	Forced pendulum			
		Relativity	P3-17-2	Time dilation			
		Optics	P4-17-2	Young's Double Slit Experiment			
Chemistry	5 - 12	Molecular	C1-5-13	Molecular weight calculator			
		Physical chemistry	C2-5-14	Additive colors: RGB			
		General chemistry	C3-5-15	Periodic table tetris			
		General chemistry	C4-5-16	Characteristics of materials			
	13 - 16	General chemistry	C1-13-17	Advanced periodic table			
		General chemistry	C2-13-18	Processes in an ideal gas			
		Reactions	C3-13-19	Stoichiometry			
		Chemical equilibrium	C4-13-20	Le Chatelier's principle			
	17 - 21	Structure of crystals	C1-17-21	Table salt			
		Inorganic chemistry	C2-17-22	Why things have color			
		Gases	C3-17-23	Gas simulator			
		Spectroscopy	C4-17-24	Molecular vibrations			
Biology	Age	Subcategory	LO number	Title			

List of LOS

B1-5-25

Fishing Biology: Environment issues 5:12

Overview:
Animals in a habitat

You may:

- try fishing by clicking and holding the mouse down to lower the hook
- move the mouse left to right to move the boat

Suggestions:
 You may use it to:

- have fun with students: catch fish and gain points
- catching turtles and fish to improve your score
- catching a tyre sinks you out and ends game
- discuss measures to conserve the environment

Learn more about it in:

ES
LT
CA

Terms you need to know:
 Fishing fun
 Don't catch the tyrol!

how to use the LOS



page discussion view source history

P1-13-5

Ohm's law Physics Electricity

Overview:

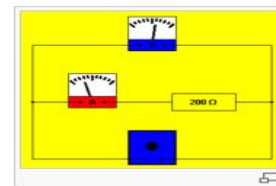
This simulation explores intensity (I) and voltage (V) in a simple circuit.

You may change the:

- Maximum values tolerated by the meters
- Resistance, R
- Battery voltage, E

You can measure:

- Intensity, I
- Voltage, V



Suggestions:

Analyse the relationship between the variables (I, V, R, E): make tables and graphs.

You could discuss the position of the meters.

Learning object available in:

- EN
- DE
- IT
- LT
- ES
- CA

Terms you need to know:

- Max. voltage
- Max. amperage
- Increase resistance
- Reduce resistance
- Increase voltage
- Reduce voltage



	en	ca	de	es	it	lt
Physics	12	3	2	5	2	0
Chemistry	12	0	1	1	1	0
Biology	12	0	1	1	1	0
Mathematics	12	2	3	4	3	0
IT	12	0	0	0	0	0
Total	60	5	7	11	7	0

- EN
- DE
- IT
- LT
- ES
- CA

navigation

- Main Page
- About
- Help
- Contacts
- Messages
- Partners
- Acknowledgements

instructions

- General
- NCs
- SCs
- Teachers

learning objects

- Complete list

forms

- All Forms

search

Go Search

toolbox

- What links here
- Related changes
- Upload file
- Special pages
- Printable version
- Permanent link

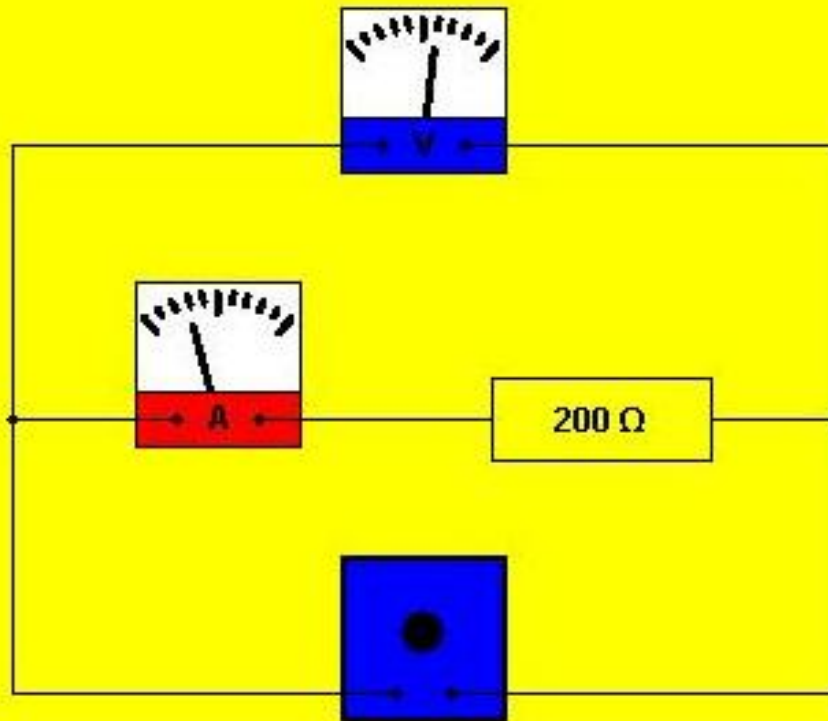
in other languages

- Català
- Deutsch
- Español
- Italiano
- Lietuvių

Termes que necessita conèixer:

- Max. voltage - Voltatge màx.
- Max. amperage - Intensitat màx.
- Increase resistance - Augmentar la resistència
- Reduce resistance - Reduir la resistència
- Increase voltage - Augmentar el voltatge
- Reduce voltage - Reduir el voltatge

Learning resource



Max. voltage:

10 V

Max. amperage:

100 mA

Increase resistance

Reduce resistance

Increase voltage

Reduce voltage

$U = 6.00 \text{ V}$

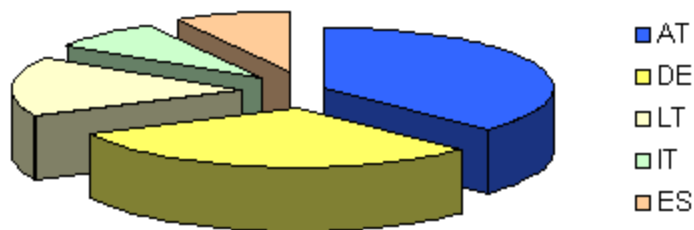
$I = 0.0300 \text{ A}$

© W. Fendt 1997

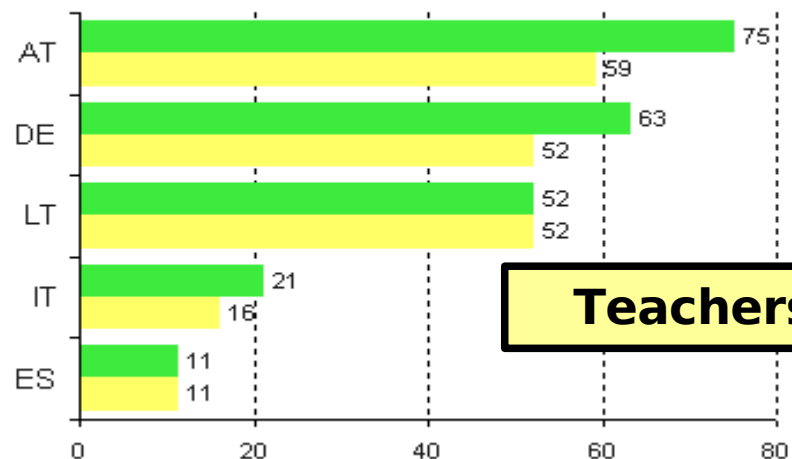
Pilot schools

Schools

Number of schools per country

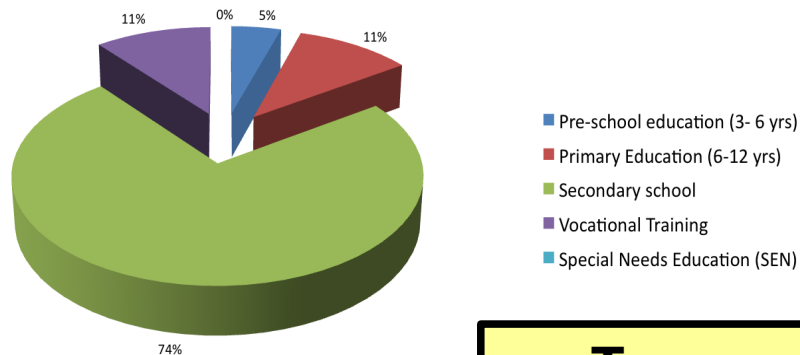


Teachers

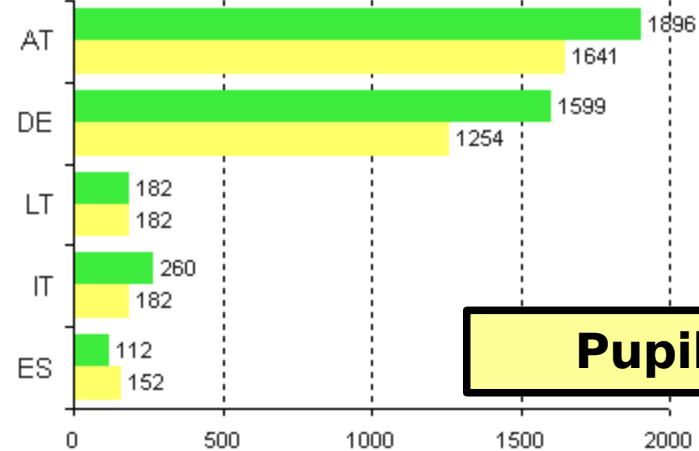


Teachers

Types of schools involved



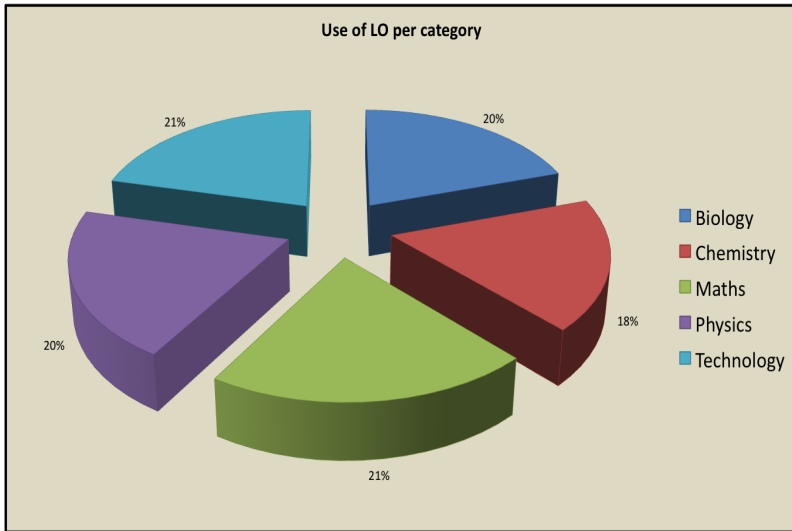
Students



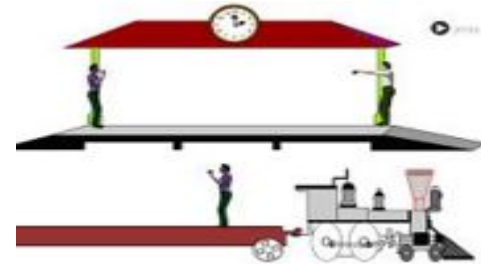
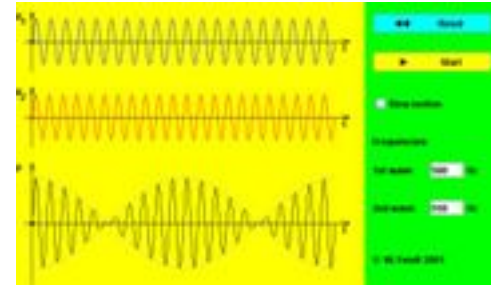
Pupils

Types

Selection of LR



The LR were used 904 times



Conservation of Energy

Conservation of Energy
Applet by B. Surendranath
Please press start

Roller height: [] Height of barrier: [] Number of loop: []
[Stop] [Start]

Tarzan

Tarzan, represented by a blue ball, is swinging from a 55 meter massless vine. Air resistance is negligible.

We also show Tarzan's weight \vec{w} , the force exerted on him by the tension of the vine \vec{T} , and the sum of these two forces \vec{S} .

$$\vec{S} = \vec{T} + \vec{w}$$

Click to pause:

Tension (in units of Tarzan's weight): 1.00

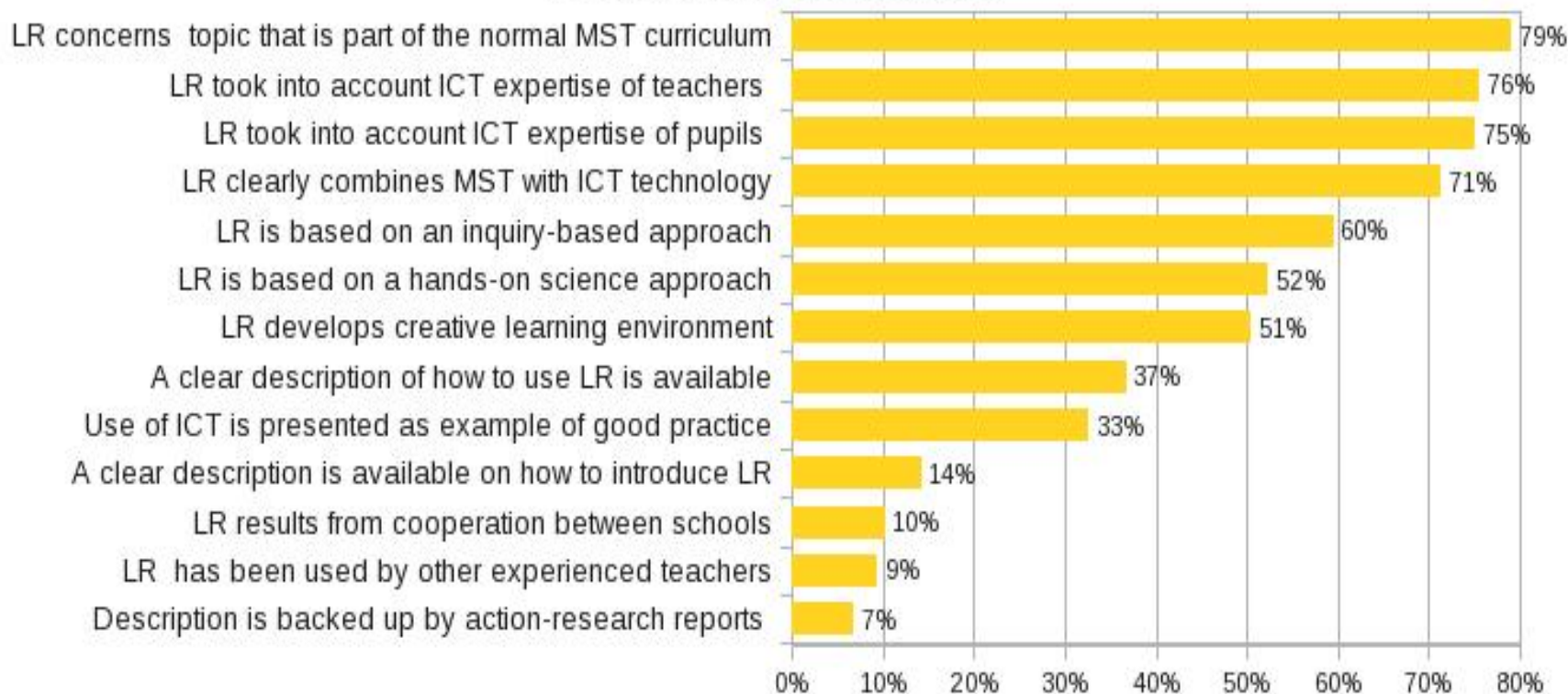
Copyright © 2005 David M. Harrison

Half-life 1.82 hours
Energy Released 1.656 eV

Fluorine-18

Selection criteria for the LR

Selection criteria for the Resources



Results from teachers

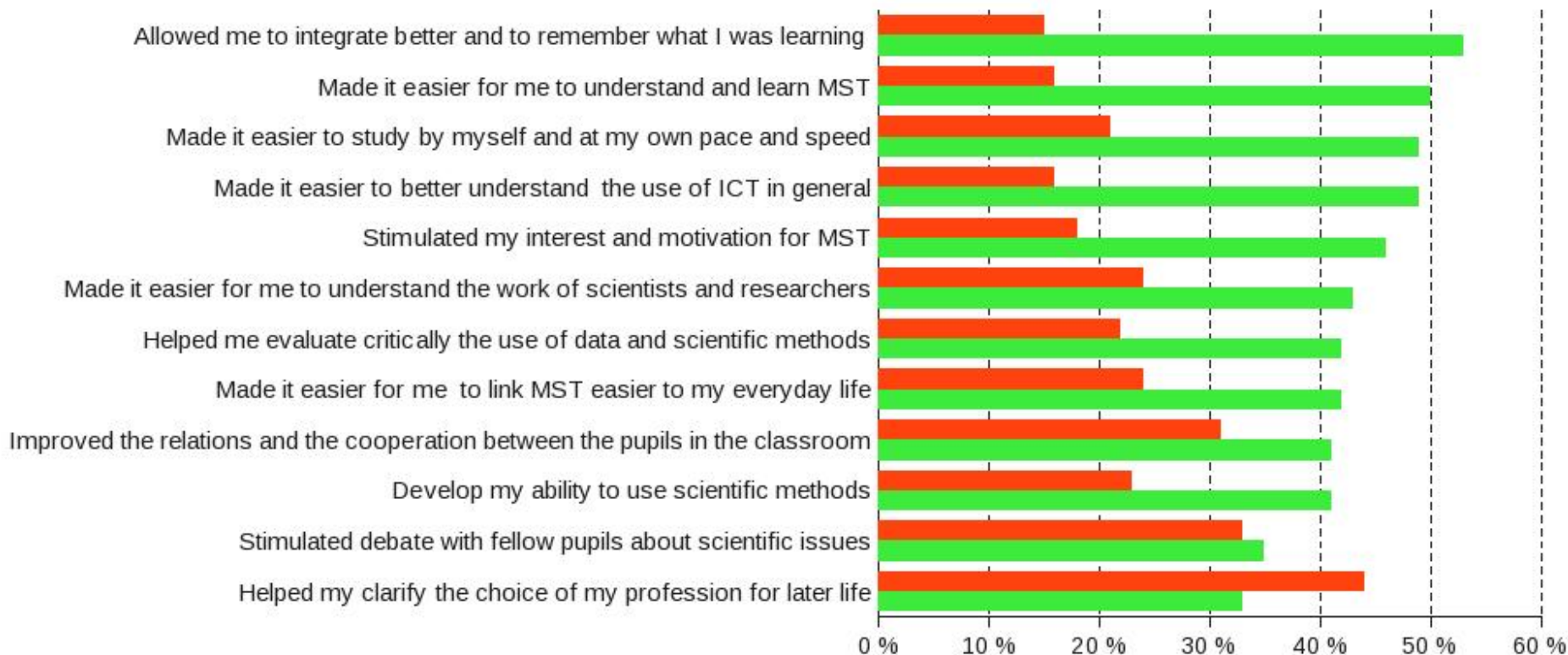
Good!

- highest impact: autonomous learning of pupils.
- $\frac{3}{4}$ LR stimulated own interest and motivation for teaching MST.
- $\frac{2}{3}$ noticed that the LR stimulated pupils' interest and motivation for learning MST

Not so good...

- AT, DE, ES and IT: [en] → [local lang]
- ES + IT: problems with PC / Internet...

Results from students



Results from students

- Greater impact on boys than on girls;
- Impact decreases with the age, specially among female students (*ICT survey*);
- For virtually all items surveyed impact perceived by LT and ES (and IT) >> AT and DE;
- No real impact as far as the number of LR used.

Conclusions

Overall, use of LR:

- **positive impact on MST education**
- **but, special attention has to be placed on:**
 - **technical requirements**
 - **localization of the LR**

Further information

<http://inspire.eun.org>

Dr. Àgueda Gras-Velázquez
aguada.gras@eun.org

Gràcies - Thank you



Take a copy
of the
Inspire report!!