

Greek Teachers' Reflections on Virtual Lab

INTRODUCTION / BACKGROUND

This report is based on the Greek teachers' views and suggestions regarding the content, usability and pedagogical effectiveness of the Virtual Lab. The data gathered during VL implementations in three state schools in the region of Crete. In total, seven implementations were conducted. Four teachers implemented the "Introduction to Nanotechnology / Nanoscale" lesson plan in three state schools from October 2013 to December 2013. Total number of students: 157 (77 boys and 80 girls).

	School	Grade	Date	Teacher	Students
1	High School, Argiroupoli Rethymnon, Crete	10 th	Oct. 2013	Ioannis Sgouros	16
2	2 nd Gymnasium Heraklion Crete	8 th	Nov. 2013	Theodora Katsiuli	22
3	2 nd Gymnasium Heraklion Crete	8 th	Nov. 2013	Theodora Katsiuli	22
4	2 nd Gymnasium Heraklion Crete	8 th	Nov. 2013	Paraskevi Ktistaki	24
5	2 nd Gymnasium Heraklion Crete	8 th	Nov. 2013	Paraskevi Ktistaki	22
6	Experimental Gymnasium Heraklion Crete	9 th	Dec. 2013	Ioannis Karadamoglou	25
7	Experimental Gymnasium Heraklion Crete	9 th	Dec. 2013	Ioannis Karadamoglou	26

Fig 1: Overview of implementations

The aim of all implementations was to introduce nanotechnology and nanoscale to the students by using the material provided in the Virtual Lab. The lessons' objectives were:

- ✓ To increase awareness about nanotechnology
- ✓ To comprehend nanoscale
- ✓ To enhance the ability to convert units into nanometres

The duration of the lessons was 45 minutes. After the implementations completion the teachers filled in the questionnaires developed by the NTSE team. The questionnaires aimed at evaluating and collecting information and suggestions on the content, usability and pedagogical effectiveness of the NTSE Project teaching materials (video, interactive animation, teacher guidelines, student guidelines).

TEACHERS' PROFILES

1. Ioannis Sgouros is a physics teacher in High school of Episkopi in Rethymnon prefecture, Western Crete. He has four years teaching experience while he has a great experience in teaching and learning using online sources. Ioannis is also a PhD student in Pedagogical Department of University of Crete in the field of nanotechnology in secondary education. As a project expert he took part in nanocamp in Varna, Bulgaria conducting the Atomic Force Microscope activity.
2. Paraskevi Ktistaki is a physics teacher in 2nd Gymnasium of Heraklion, Eastern Crete. The school was very active during the nano poster competition since eight groups of students participated in the competition. The winning poster for Greece came from this school and four students along with the headmaster took part in the nanocamp in July, 2013. Paraskeui, has 12 years of teaching experience and consider herself as a much experienced teacher in using online resources.
3. Theodora Katsioli is also a physics teacher in 2nd Gymnasium of Heraklion. She has 10 years of teaching experience and consider herself as average in using online resources for teaching and learning.
4. Ioannis Karadamoglou is a physics teacher in Experimental school of Heraklion. The Model Experimental Gymnasium of Heraklion is an elite school in Heraklion district. Students gain entry through an entrance exam that has recently been implemented. All classrooms are equipped with interactive whiteboards. Ioannis, has a great experience in using online resources.

TEACHERS REFLECTIONS

The following analysis is based on the teachers' views and suggestions regarding the content, usability and pedagogical effectiveness of the Virtual Lab.

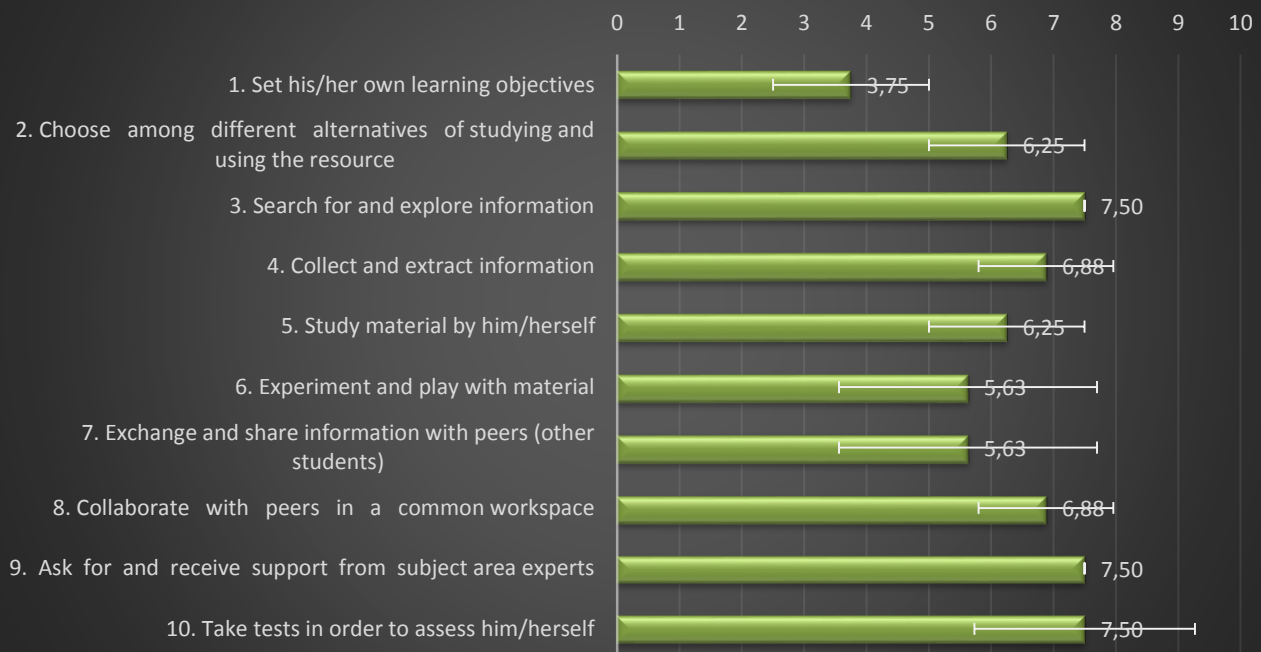
The charts below shows their responses:

A. Pedagogical Criteria / Requirements



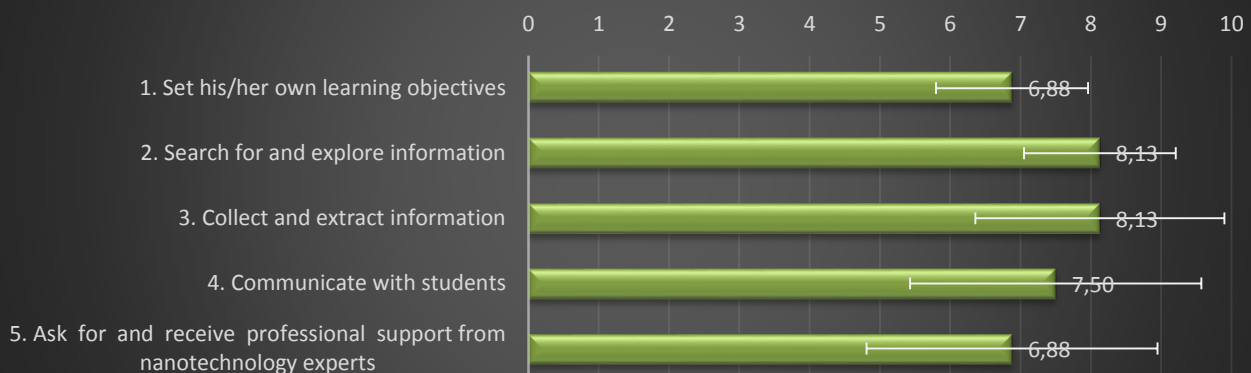
The feedback regarding the general pedagogical criteria was quiet positive with the “clarity of the stated educational aims and learning outcomes (in Teachers’ Guidelines) scoring 8.13/10.

Student-focused pedagogical requirements



Regarding the student-focused pedagogical requirements it is worth mentioning the relatively low score of “Set his/her own learning objectives”. This was expected in a way since the VL experiments are more towards the structured / guider inquiry-based learning rather than open inquiry-based learning.

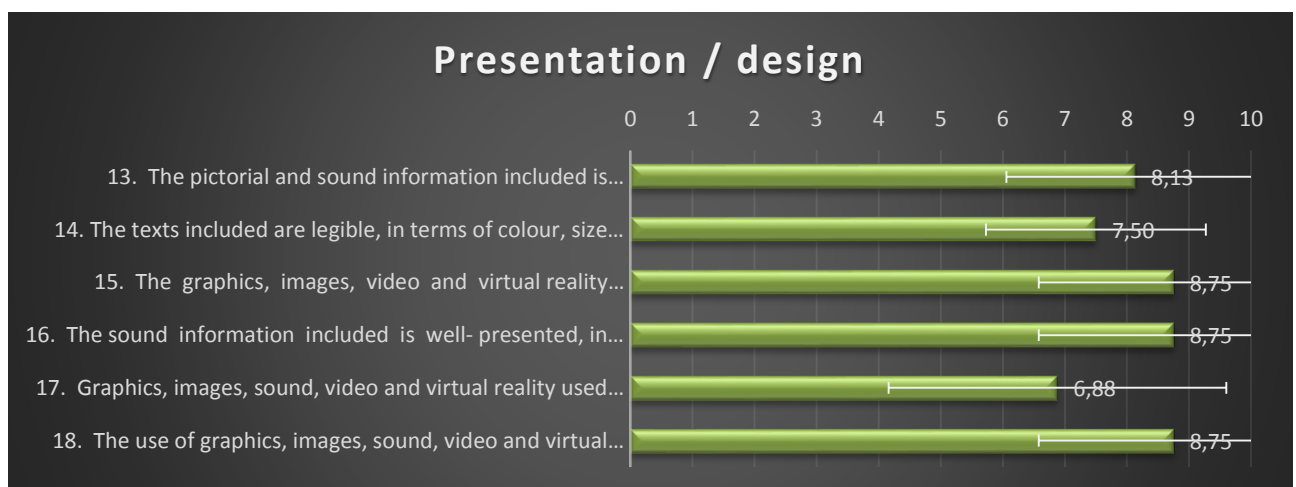
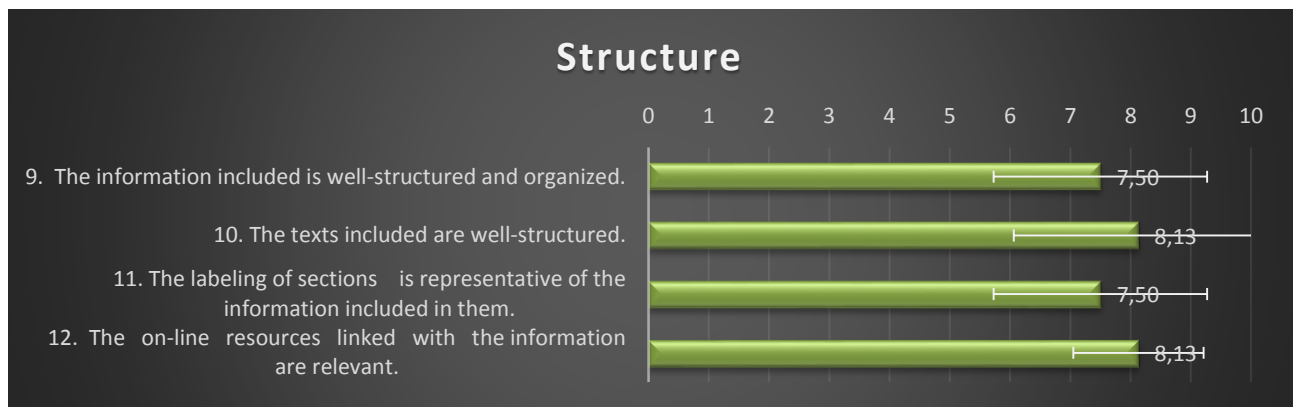
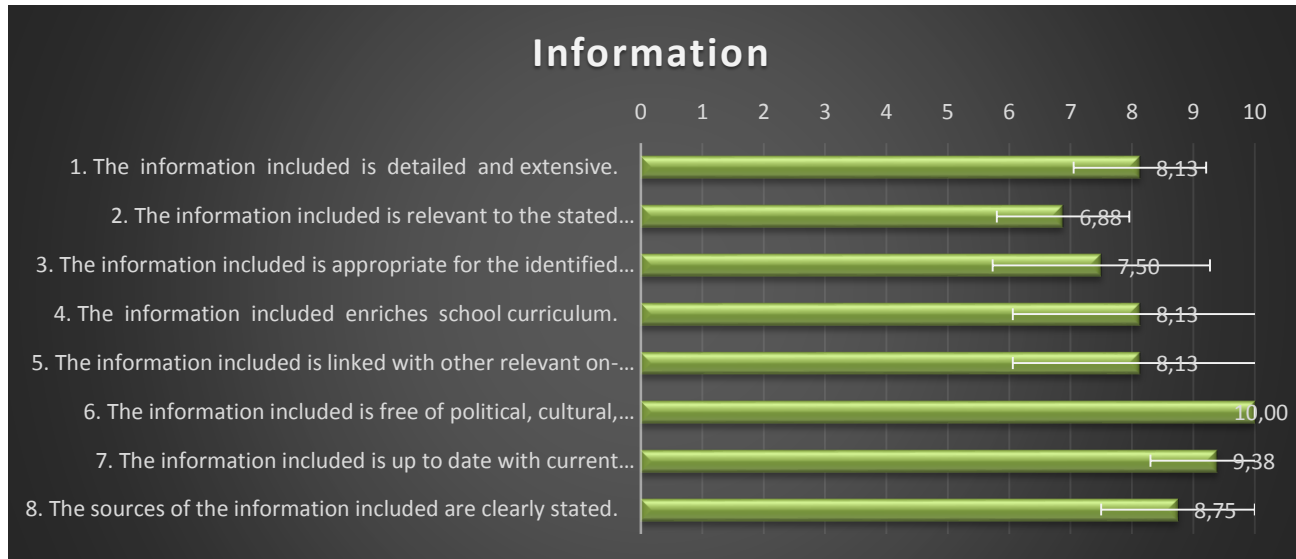
Teacher-focused pedagogical requirements

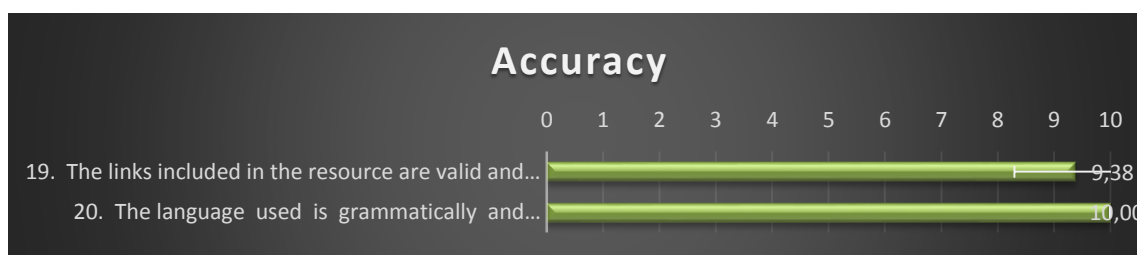


On the other hand the educational materials provided let the teacher in a high degree to set his/her own learning objectives, have access to information and communicate with his/her students.

B. Virtual Lab Content

Regarding the content of the Virtual lab the graphs below show that all four teachers much appreciated the information included as per all different aspects, the structure, the presentation / design and the accuracy.





Finally here are few teachers' statements:

Ioannis Sgouros:

"Understanding Nanoscale went really well. The educational objectives linked to students' pre-knowledge" (10th grade students)

"The educational material should be updated regularly"

Paraskevi Ktistaki

"Students really enjoyed the interactive animations"

"The theoretical part was a bit tiring for the students since they had little pre-knowledge of the subject matter". (8th grade students)

Theodora Katsioli

"Emphasize more to why do these phenomena happen" (in regards to physical / chemical properties dependencies on scale)

Ioannis Karadamoglou

I spent more time in explaining student's observations. Students always want to learn why phenomena that they observe are happening"

The hands-on experiment part went really well. Pupils like that and it is missing in the Greek curriculum"