

GEOschools

INTEREST RESEARCH
Portugal

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Results from a statistical Interest research on Geosciences in the secondary schools - Portugal

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Introduction

The present report aims to present the results of the Interest Research on Geosciences in the secondary school in Portugal. This research comes in the scope of the European project “Teaching Geosciences in the secondary schools”, aiming to define a “Framework on geosciences literacy principles” for the general European citizens. This interest research took place in Portugal, Greece, Italy and Spain where 1749 students and 58 teachers answered to a dedicated questionnaire.

The questionnaire

The survey included both closed questions and open-ended questions (Fermeli, 2011). Besides demographic characteristics, there are questions about geosciences interests, some questions about the role of geosciences in the society and on the teaching strategies and finally there is opportunity to express a free comment (Fermeli, 2011). To prepare this questionnaire an analysis to all national curriculum and textbooks and a curriculum comparison research were made (Calonge, 2011a; 2011b; Rodrigues *et al.* 2011).

The sample

The sample from Portugal comprises 284 students from the obligatory school, 91% under 14 years old and 9% over 15 years old from the 7th and 8th grade and their Natural Sciences teachers (12). The students were 54% male and 46% female, selected from 12 Portuguese schools: 51 from private schools, 92 from schools located in the cities, 86 from the countryside and 55 from the cities surroundings.

Research Results

Students:

Considering the students interest (TABLE I), the most motivating themes are “Palaeontology” (3,80), “Natural Hazards” (3,69), “The Earth Yesterday, Today and Tomorrow” (3,67) and “How to teach Geosciences”(3,87) and the less interesting are “Geological Maps” and “The Measure of Time”. Comparing with Greece, Italy and Spain “Palaeontology” and “Natural Hazards” are also the most interesting topics in that countries and “Geological Maps” and “The Measure of Time” the less interesting for all (Fermeli *et al.* 2013). In the Portuguese curricula for Natural Sciences in the 7th grade, “Palaeontology” and “The Measure of Time” are associated in the same topic. As a whole, the total interest of students in all topics is higher in students from Portugal (3,80), followed by Italian (3,70), Greek (3,69) and Spanish students (3,63) (Fermeli *et al.* 2013).

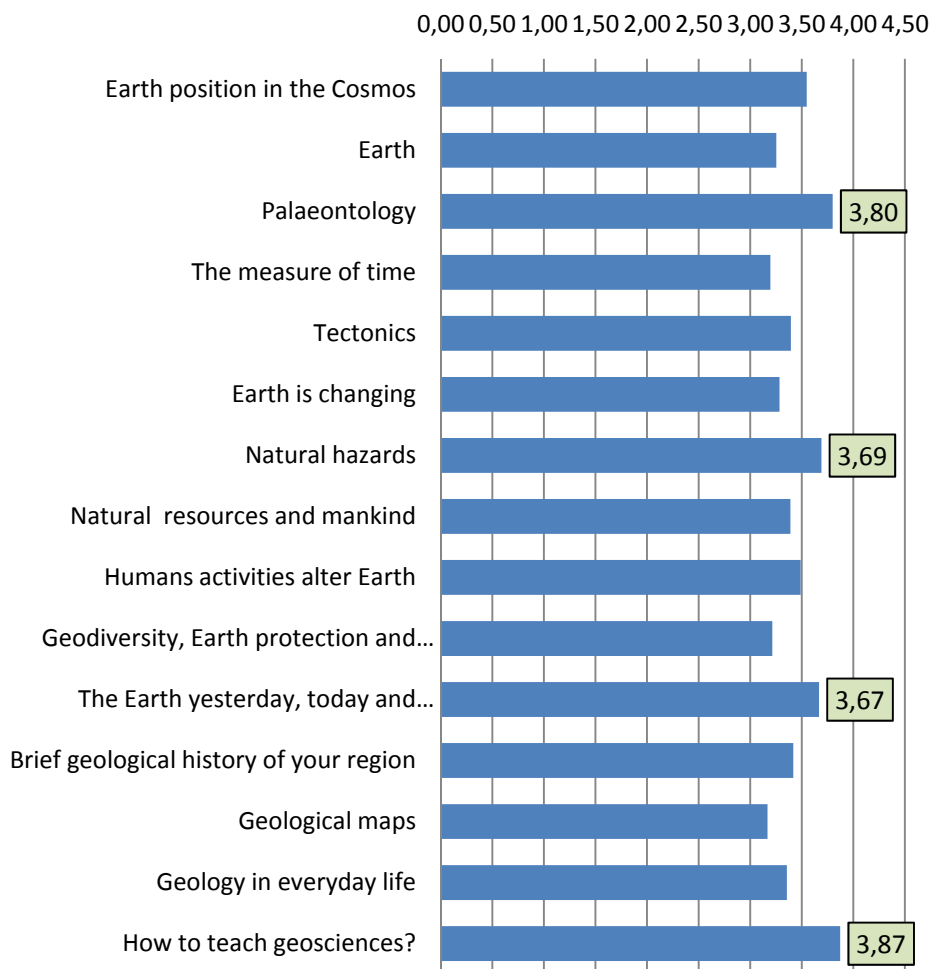
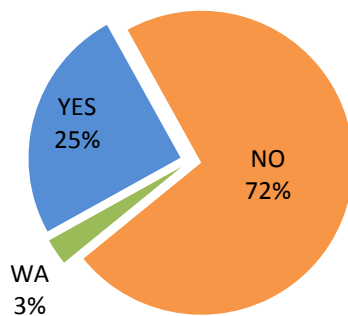


TABLE I - Students Interest (interest scale 1-5)

Portuguese curricula promote the field work and suggest the teachers to explore the rocks around the school, however only 25% of the students know the types of rock of their region (TABLE II) and only 1,4% know their age (TABLE III). When teachers do fieldtrips they prefer to go to places far from the school where there are didactical tools or guided tours to support them, than to explore the geology around the school.

Do you know the type of the rocks of your region?



Do you know the age of the rocks of your region?

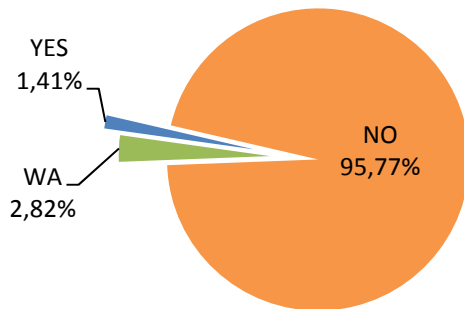
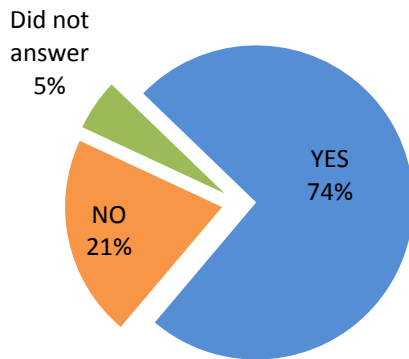


TABLE II – Students’ knowledge concerning the type of rocks in their region *TABLE III - Students’ knowledge concerning the age of rocks in their region*

74% of the students think that geology is useful for other scientists and technicians (engineers, biologists, conservationists, etc) (TABLE IV) and 55% think that basic geological knowledge is useful for everyday life of people, 29% think it is not and 16% didn’t answered (TABLE V). This shows that Geology is present in the Portuguese curricula for some years and the students are already aware for its role in the society. However, if we compare with the other countries (TABLE VI) Portuguese students are the ones who less believe that geological knowledge are useful for everyday life of people.

Do you think that geology is useful for other scientists and technicians?



Do you think that basic geological knowledges are useful for everyday life of people

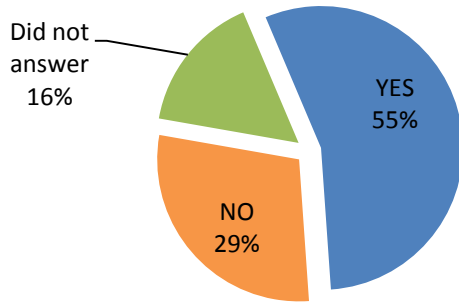


TABLE IV–Students opinion about the importance of geology TABLE V – Students opinion about the importance the geological knowledge

Do you think that basic geological knowledges are useful for everyday life of people

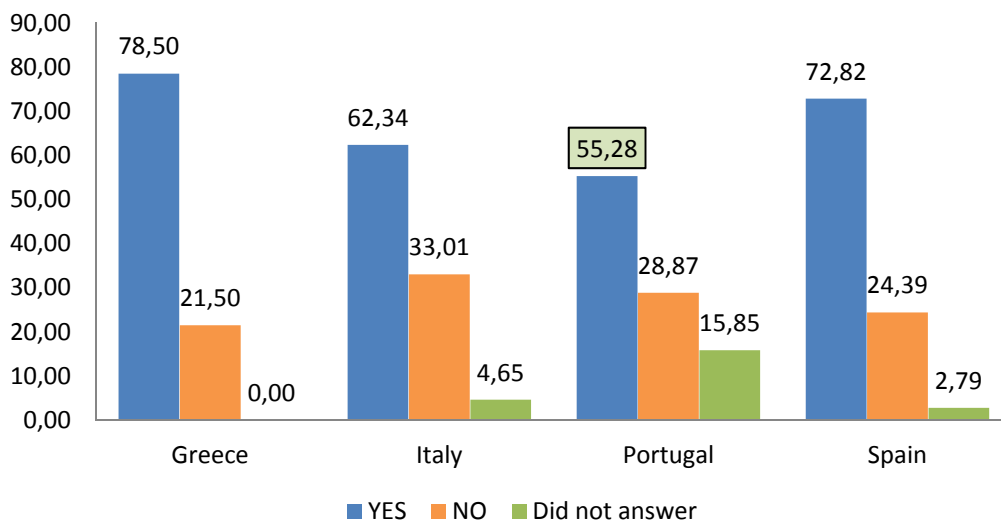


TABLE VI - *Students opinion about the importance the geological knowledge: comparison between Greece, Italy, Portugal and Spain*

Natural Sciences teachers in Portugal from Secondary School can be graduated in Geology, Biology and Biology-Geology – Education, and for that only 24% of the students answered that their teachers were geologists (TABLE VII).

Was the teacher teaching you geology at school a geologist

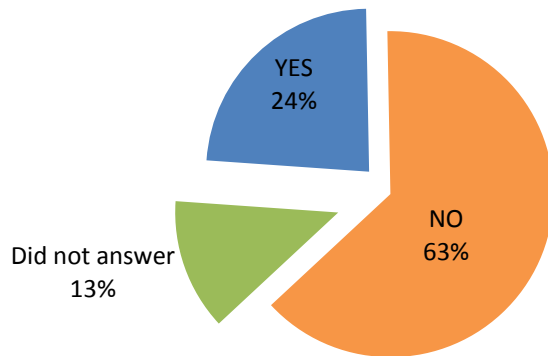


TABLE VII – *Teachers specialization*

When the students were asked if they would like to have Geology lessons at schools 52% of the male students said yes and 37% no (TABLE VIII). 76% of female students answered yes and only 20% said that don't want Geology lessons. Considering to proceed geology studies in the University 70% of the male students said they don't want and 50% of female students said they wouldn't like to study geology at the university (TABLE IX). These were the lowest rates comparing with Greece, Italy and Spain (Fermeli *et al.* 2013). Although geology contents are a reality for some years in Portuguese curricula, Geology as a choice for future is still only for few students, mostly because Portuguese society doesn't open space for geology professionals, the opportunities for working in Portugal are not clear, and students don't see the importance of the geologist in daily life. We have been concluding that the students do learn about Geology but does not mean that they show interest for it, which may result from teaching strategies used in Portugal.

Would you like to have Geology lessons at school (gender)

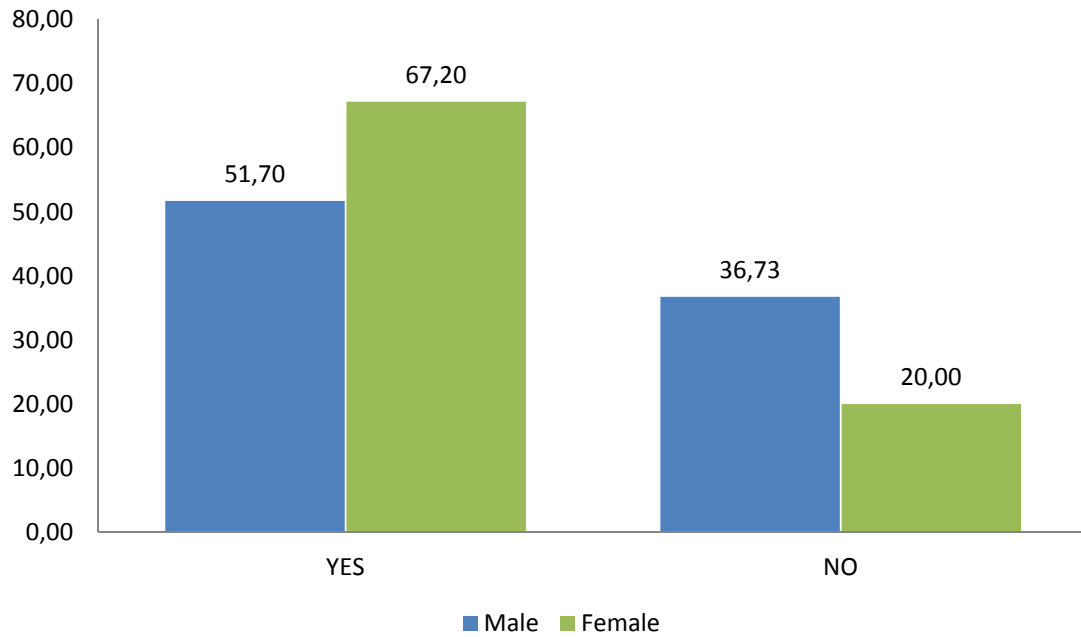


TABLE VIII – students interest on studying geology at school

Would you like to study geology at the university (gender)

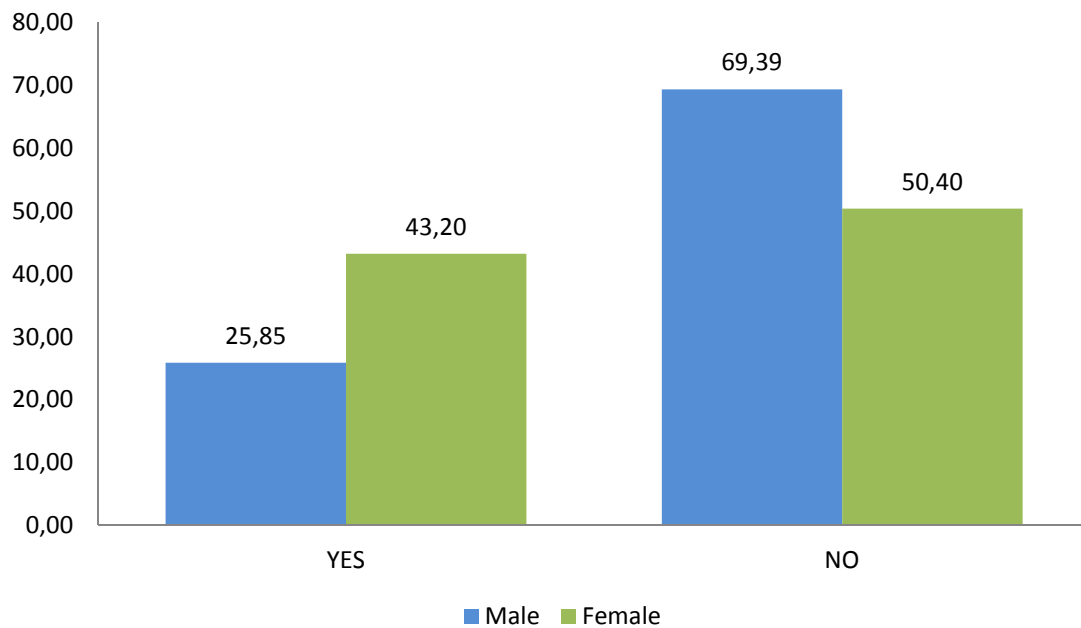


TABLE IX – students interest on studying geology at the university

About which way would the students would like to be taught on geosciences (TABLE X) most of them prefer to make experiments in the laboratory (4,25) and to make fieldtrips (4,16). Students are more aware for activities where they are actively involved building its own knowledge.

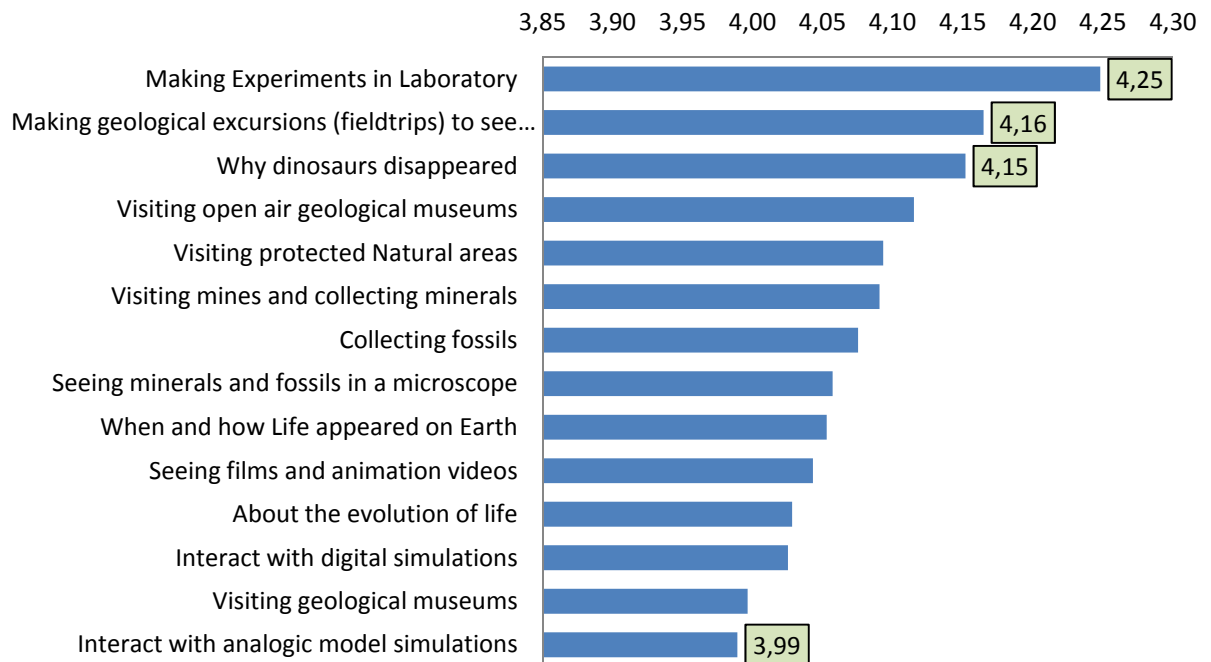


TABLE X – Students interest on teaching strategies (interest scale 1-5)

Teachers:

The most interesting subjects for teachers are “Palaeontology” and “Brief geological history of your region” and the less interesting are “Earth position in Cosmos” and “Geological Maps” (TABLE XI). “Paleontology” is also the most internist topic for the students (TABLE I). “Geological maps” is as well the less interesting topic for the students TABLE I) perhaps because of the lack of motivation of the teachers that usually fell scientifically unprepared for this subject.

Generally, the total interest of teachers in all topics is higher than students (Fermeli *at al.* 2013). Teachers from Portugal give the highest rate (4.17), followed by Greek (3,93), Italian (3.86) and Spanish teachers (3.40) (TABLE XII)

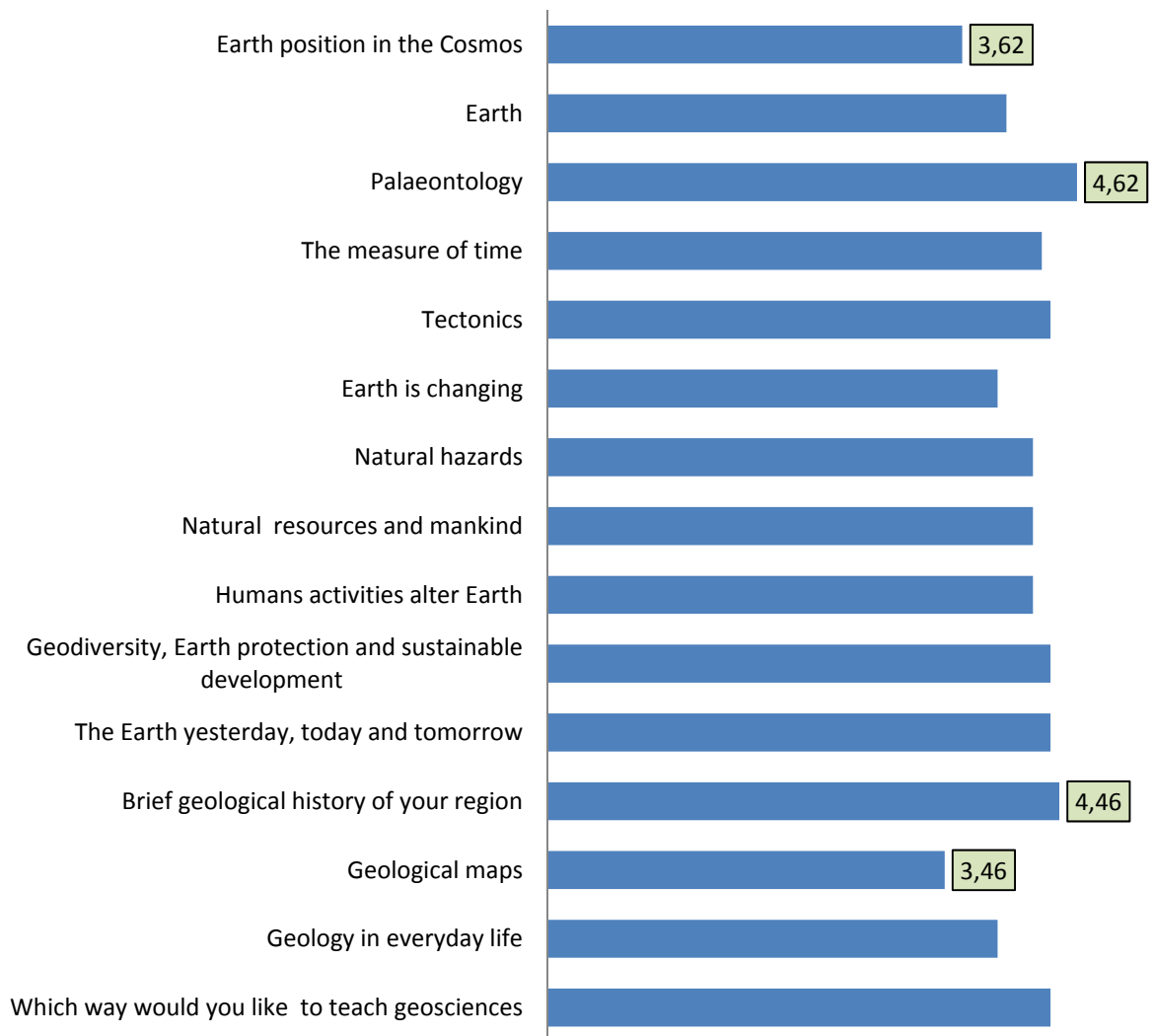


TABLE XI – Teachers Interest (interest scale 1-5)

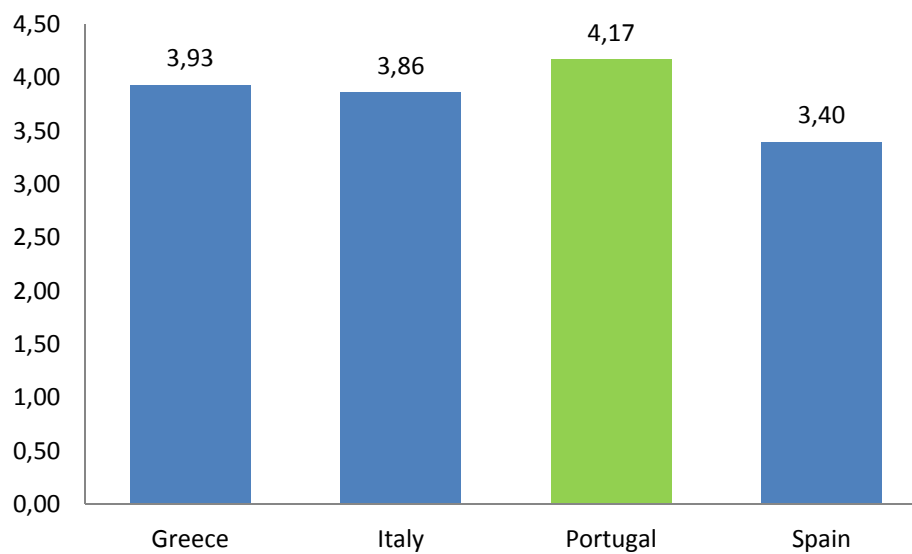


TABLE XII – Teachers interest – total score (interest scale 1-5): comparison between Greece, Italy, Portugal and Spain

About teaching strategies, teachers would prefer fieldtrips (4,92), making experiments in laboratory (4,77), using interactive digital simulations (4,77) and geological activities in the field (4,77) rather than visiting mines and collecting minerals (3,54) and collecting fossils (3,62) (TABLE XIII). This shows that teachers desires to teach in the field and perhaps they don't do it so often because they don't feel prepared, they don't have enough support concerning didactical tools and because Portuguese legislation complicates the exit of teachers and students from the school. On the other hand we can conclude that the teachers are aware for geoconservation and don't agree with mineral and fossil collecting as teaching strategy.

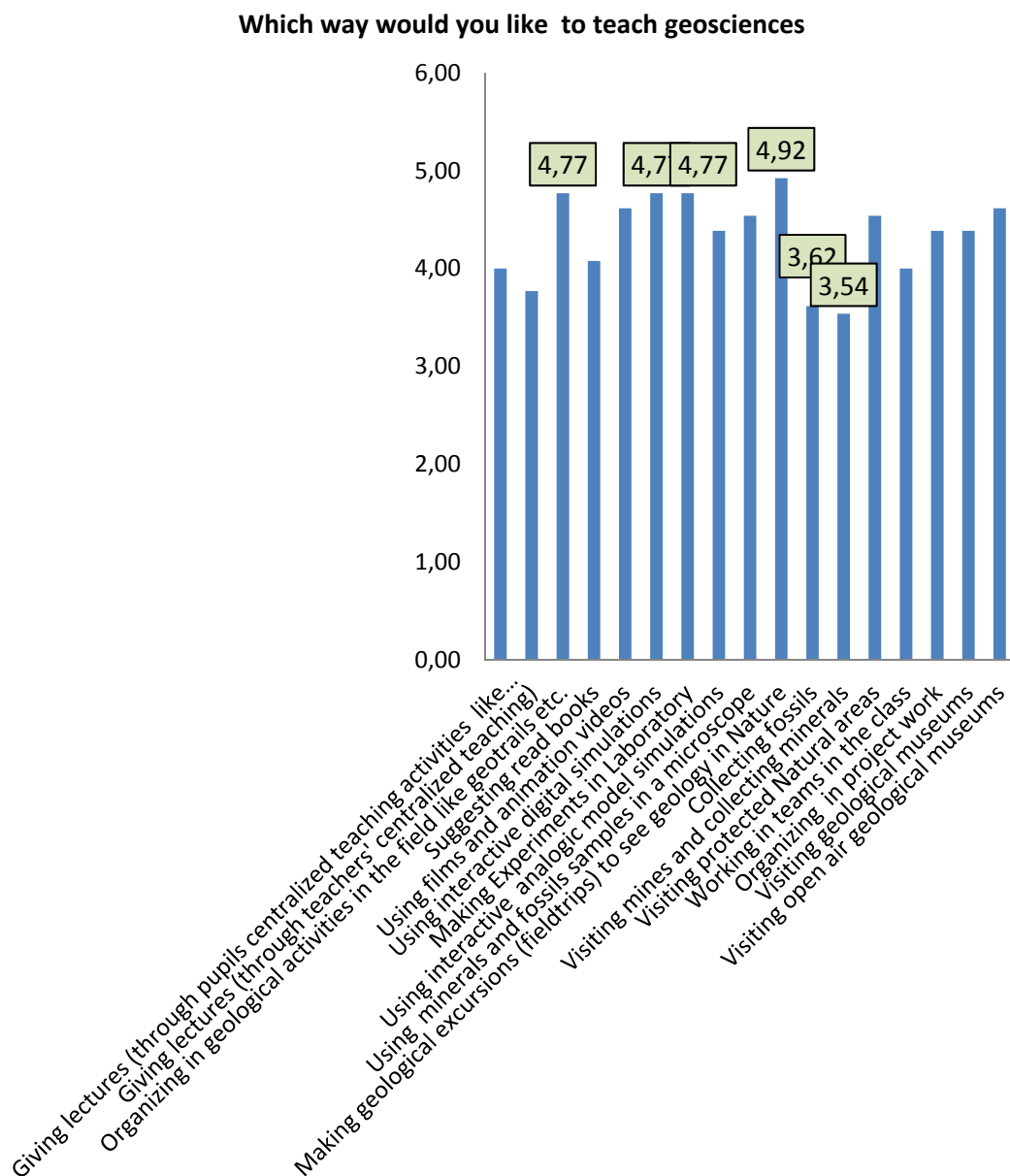


TABLE XIII – Teachers interest in the way they would like to teach geosciences

40% of the teachers would like to be trained in geological subjects of their interest to improve their knowledge, 20% to improve the quality of their classes, 20% to better transmit the knowledge and 20% to know their region (TABLE XIV). Comparing with the other countries, Portugal is the only country where all the teachers would like to be trained (TABLE XV).

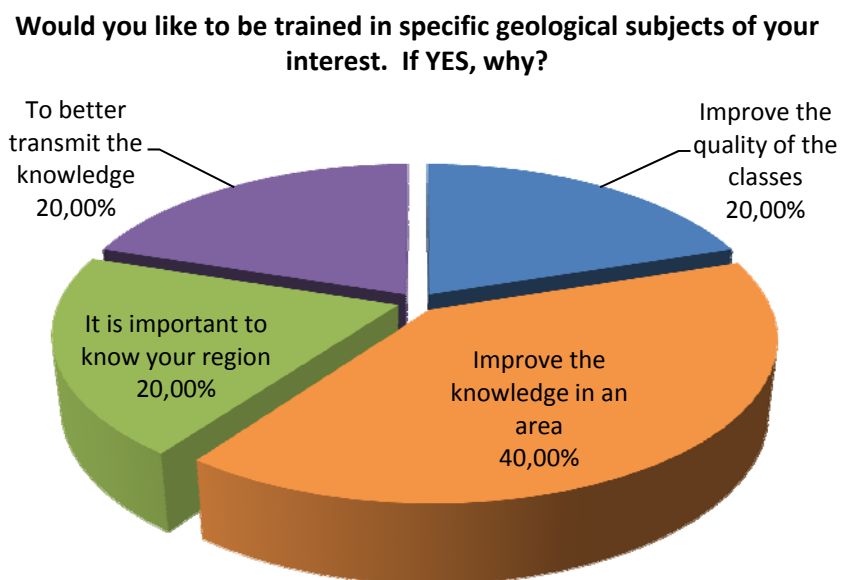


TABLE XIV – Teachers interest in being trained on geological subjects

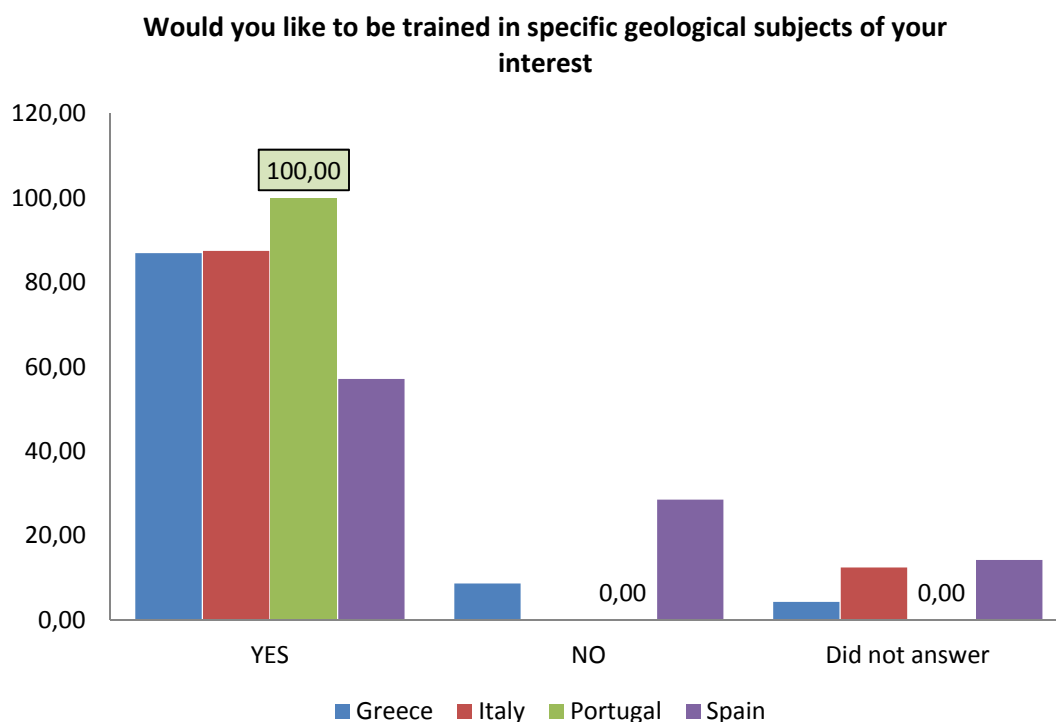


TABLE XV –Teachers interest in being trained on geological subjects – comparison between countries

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