EXPERIMENTAL SCIENCE TEACHING IN BASIC EDUCATION IN PORTUGAL: EVALUATION OF THE IMPACT OF A NATIONAL TEACHER EDUCATION PROGRAMME

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The object of this evaluation study is the Teacher Education Programme in Experimental Science Teaching (PFEEC), by requirement of the Ministry of Education of Portugal in 2011 (Martins et al., 2012). The PFEEC was conceived and developed between 2006 and 2010, involving 4 Universities and 14 Polytechnic Institutes, by a Technical Advisory Committee of the Research Centre "Didactics and Technology in Education of Trainers" (CIDTFF), UA, who has elaborated supporting Teaching Guides based on research, addressing several themes considered relevant to the first school years concerning Physics, Chemistry, Biology and Earth Sustainability (Figure 1). In total 140 000 pupils and 7 000 school teachers were involved. The main aim of PFEEC was to prepare primary school teachers to develop experimental science teaching. Figure 2 indicates the numbers of institutions and participants involved in the study in each of the four school years.

This research using stratified sampling design allowed to measure indicators on the valorization, by the teachers, of the proposals of experimental teaching and learning of science. The participation in the PFEEC provided the teachers with more educational activities related to science learning through experimental strategies.
Authors of textbooks (1st to 6th grade) recognize the relevance of the PFEEC. In particular, the supporting Teaching Guides had a great impact on the recently published Science textbooks.

In the schools' dynamics there are indicators on the active role played by teachers who attended the programme, by creating contexts to enhance the importance of science education in the early years.
Concerning the pupils' learning, the study conveys modest average scores in the questionnaire for both groups of pupils whose teachers either attended the PFEEC or not. However, there are significant differences between the two groups if we consider the 25% of pupils with the best marks, with the PFEEC group in the lead position. Moreover, the syllabuses of Science Education Courses in Teachers' Graduation degrees, in the Universities and Polytechnic Institutes, integrated objectives outlined in the PFEEC.

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	NUMBER OF			
School year	School-clusters	School	Teachers	Pupils
2006 - 2007	245	581	986	17472
2007 - 2008	498	1495	2961	53986
2008 - 2009	484	1471	2940	53732
2009 - 2010	298	698	1215	24169

FIGURE 1
Teaching Guides conceived and used in the PFEEC

FIGURE 2
School-clusters, schools, teachers and pupils involved in PFEC, 2006-2010