

# **Analysis of the questionnaire on physics education research and teacher education (QPE)**

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*The European Physical Society (EPS) has 40 national physics societies as members. The QPE was sent to all the societies by the EPS Mulhouse secretariat. A total of 16 answered questionnaires came back in all of 2008 (Albania, Austria, Flemish Belgium, Croatia, Finland, France, Hungary, Italy, Liechtenstein, Macedonia, Malta, Moldova, Romania, Slovenia, Sweden, United Kingdom). The questionnaire from Liechtenstein is not included in this analysis because there are no directly relevant institutions and activities there.*

*Some large countries, such as Germany and Spain, did not reply. In the case of Germany, it is almost impossible to answer the questionnaire because not only each of the 16 states (Bundeslaender) has a different situation, but even the situation within some of these states can differ from university to university.*

*The analysis is therefore incomplete. Nevertheless, it reveals great differences in the situation in physics education research and teacher education.*

*The poster at the end of this document was presented at the GIREP-EPEC-conference in Leicester/UK from 17 – 21 August 2009.*

## **A) University statistics**

*The number of universities or university-like institutions per country varies between one (Malta) and 151 (UK). Very roughly half of these institutions offer physics degrees, and also very roughly half of these institutions train future physics teachers. In almost every country there are professors of physics education; sometimes there are more general science education lecturers (UK). In general, the number of such professors seems to be small with regard to the importance which the EPS, national physics societies or governments describe as necessary in order to have a high level of physics teacher education.*

*The professors of physics education are found mostly in physics departments (7), sometimes in physics and education departments (5) and sometimes in departments of education (3).*

## **B) Physics teacher training and school level educational research**

### **1) How do physics teachers get their training in your country? (If several options apply please indicate relative proportions.)**

**a)** They follow a special programme for teachers of physics (maybe in combination with another subject) at a regular university

*Yes in 11 (of 15) cases*

If so, is this a Bachelor, a Master or a non-Bologna degree?

*6x Master; 3x non-Bologna*

- b) They follow a special programme for teachers of physics (maybe in combination with another subject) at a specialised university (e.g. University of Education, Teachers' College, etc.)

*Yes in 6 (of 15) cases*

If so, is this a Bachelor, a Master or a non-Bologna degree?

*2x Bachelor, 1x Master, 2x non-Bologna degree*

- c) They have to complete a regular physics degree, followed by a period of "postgraduate" training, also based at a regular university.

*7x yes; in some cases only part of the physics teachers select this option.*

Is the physics degree a Bachelor, a Master or a non-Bologna degree?

*Could be a Bologna Bachelor or Master, a non-Bologna degree or it is even not clear.*

If it is a Bachelor degree, does the postgraduate study consist of a Master degree, a non-Bologna qualification, or a combination of both?

*The trend goes towards a Bologna Master.*

- d) They have to complete a regular physics degree, followed by a period of "postgraduate" training at a specialised academic/ non-academic institution.

*This is an option in a few cases, sometimes in universities sometimes in non-academic institutions.*

## **2) Who teaches the physics teacher education? (If several options apply, please indicate relative proportions)**

- a) Professors/staff members especially trained and/ or appointed for this task

*In 12 of 15 cases*

- b) University physicists from various groups who have developed an interest in it and devote part of their time to it

*In 8 of 15 cases*

- c) High school teachers hired to teach didactics courses (no research)

*Only in a few cases*

*Generally, it seems that specialized lecturers teach the physics teacher education, supported but not in all cases, by physicists with interest in this area. High school teachers participate only seldomly.*

## **3) Who does the research in (school level) physics education? (Multiple answers are possible.)**

- a) Professors/staff members appointed for this task

*In 13 of 15 cases*

- b) University physicists from various groups who have developed an interest in it and devote part or all of their time to it

*In about 9 from 15 cases*

*Research seems to be concentrated on staff members appointed for this task, but also, in a remarkable percentage, performed by university physicists interested in this area. External institutions are generally not involved.*

### **C) Main tasks of professionals in school-level physics education**

**1) General Teaching (Not only for those intending to be teachers)**

*The teaching of physics (11/15) and didactics of physics (12/15) is the main task; general didactics normally is not.*

**2) Teacher Training**

*The courses for students training to become teachers (pre-service programs) are the main tasks (13/15); courses for teachers already employed in schools only in about 7 out of 15 cases. Visiting physics teachers in schools seldomly (about 4/15).*

**3) Research Lines**

*Empirical research on the success of teaching concepts and methods, curriculum development, research closer to the discipline of physics, e.g., development of new experiments and research on ICT contributions to physics education are the main tasks (about 7/15).*

### **D) Research in physics education (all levels)**

**1) On which level is physics education research in your country mainly focused: primary school, secondary school (please specify age range(s)) or university level? Please list your choices in order of effort with the area of highest effort at the top?**

*Main focus is on secondary school level (14/15) followed by primary school level (7/15), then university level.*

**2) How do you judge the possibilities of acquiring research grants for projects in physics education?**

*Nobody judges the possibilities to be very easy: more difficult than in other fields (7/15), very difficult (6/15).*

**3) Please give a rough estimate of the number of PhD students who have completed a PhD in physics education research in your country in the last 5 years?**

*This differs between 0 (small countries) and 30 (France).*

**4) Are there trends in the number of such students?**

*The number of these students is constant (5/15) or slightly increasing (5/15).*

**5) What is your experience in regard to relations between researchers in physics education and those in fundamental or applied research at the universities?**

*Many contacts (2/15; Hungary, Romania), some contact (12/15), almost no contact (2/15; France, UK)*

**6) Are physics departments supportive of groups working in physics education in allocating positions and resources?**

*very supportive (1/15; Macedonia), somewhat supportive (8/15), not very supportive (4/15)*

*The connection between physics educational and physics departments probably depends on personal relationships.*

## **E) Physics education community**

**1) Is there a community of people who are specialists in physics education in your country?**

*yes (9/15); loose, in some cases*

*informally organized (2/15); professionally organized (7/15); not organized at all (6/15)*

*organized in physics departments (3/15); education dep. (4/15)*

**2) Are there any centres for physics education research outside the universities in your country?**

*Only in one country (Italy)*

**3) Name up to three journals in which people working in physics education in your country (university) most frequently publish their articles.**

*Physics Education (7/15), The Physics Teacher (2/15), GIREP proceedings (2/15), Praxis der Naturwissenschaften/German (2/15)*

*Small and Eastern European Countries tend to publish in Anglo-Saxon journals; bigger countries (Italy, France, Germany) have journals in their own language.*

**4) Name up to three journals that are regarded as an essential resource for people working in physics education in your country (university).**

*Physics Education (11/15), The Physics Teacher (6/15), International Journal of Science Education (6/15), American Journal of Physics (5/15), European Journal of Physics (3/15)*

**5) What type of physics education research projects or grants are most often aimed at /granted in your country (university)?**

*local (4/15), national (6/15), EU (6/15)*

## **F) Political Interest in Physics Education**

**a) University level**

*interest decreasing only in one country (Malta)*

*interest growing (3/15)*

*no clear trend (12/15)*

**b) Ministry level**

*interest decreasing (3/15)*

*interest growing (5/15)*

*no clear trend (7/15)*

*Generally, there seems to be a slightly growing interest, but see pessimistic comments from France, Hungary, Italy and UK.*