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Health Education: Analysis of teachers' and future teachers' conceptions from 16 countries (Europe, Africa and Middle East)

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Abstract

School is an important setting for health education and health promotion, and it has been recognised that teachers' conceptions play a crucial role for the effective implementation of school health education. With the European FP6 Biohead-Citizen project on "Biology Health and Environmental education for better citizenship" we analysed the potential differences between several countries by associating teachers' and future teachers' conceptions to controlled parameters, such as level of training, religion, political view. A questionnaire was constructed during the first year of the project, and following a pilot test, the final questionnaire was applied to 6379 teachers and future teachers. We then used well-suited statistical multivariate methods to investigate complex data featuring the conceptions of many individuals, according to many topics. We show that a prominent source of variation in teachers' conceptions is related to countries, and further suggest that there are differences in two kinds of conceptions: a) individual health responsibilities and abilities; b) social policies. Religion, academic level or training had also an impact in teachers' conceptions of health education. Another important feature is the gap between what teachers and future teachers say about their own health and what they say it should be taught in school. Results are then discussed.

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"Happy is he who lives to understand,
Not human nature only, but explores
All natures, - to the end he may find"

William Wordsworth (1770-1850)

Health education is promoted not only via the social context (i.e. living conditions at school, attention paid to pupils' health and wellbeing, Allensworth & Kolbe, 1987; Gold, 1994) but also via pedagogical practices. In the 20th century the education systems of Western countries developed important action plans to improve the health of nations and to promote healthier lifestyles. Since children and young people from a wide range of social and cultural backgrounds spend most of their daily life at school, these institutions have been seen as a privileged setting for identifying children's health needs and implementing health education interventions.

The second half of the 20th century saw the surge of public investment in national infrastructure and services to promote health and to prevent disease. Simultaneously, and due to high health sector costs, the argument that "prevention is cheaper than cure" persuaded national health authorities to extend their work beyond the prevention of disease towards the notion of improving health through health education (Katz & Peberdy 1997), such as family planning, prevention of venereal diseases, accident prevention, vaccination, female cervical smear checks, and controlling weight, alcohol consumption and smoking (DHSS 1976). This view of health education is well inscribed in the classical "biomedical model of health".

In the 1970s, health educational campaigns were strongly promoted, to transmit information about diseases and their prevention, mostly by promoting behaviour changes. In general these educational programmes focused on the transmission of information – or knowledge – without regard for pupils' socio-economic contexts, so that their impact in terms of healthier behaviour changes was not significant (Scriven, 1996). This narrow emphasis on diseases prevention and on the personal lifestyles came under criticism for distracting attention from the social and economic determinants of health and the tendency to blame individuals for their own illness (Ewles & Simmet, 1999).

A broader approach of "health promotion" emerged in the 1980s, addressing not only the transmission of knowledge (traditional health education) but also the need for political and social action as well as the involvement of the individuals themselves in shaping their own health future. In this period, and with the urgency of preventing AIDS, the role of health education became socially more important and a new generation of interventions have been implemented, mainly based on attitude and behaviour change (Mérini et al., 2004; Broussouloux & Houzelle-Marchal, 2006). These educational campaigns have had in mind not only the social context but also the need for pupils' empowerment to make healthy choices (Jones & Naidoo, 1997; Ewles & Simmet, 1999).

The high social impact of this area of knowledge and social intervention led to numerous attempts to define "health education", most of them based upon the close-related concept of "health promotion" defined by the World Health Organisation (WHO, 1986:1):

"Health promotion is the process of enabling people to increase control over, and to improve, their health".

Of the several proposed definitions of health education (Green & Kreuter, 1990, 1991, among others) we wish to highlight the one by Keith Tones e Sylvia Tilford (1994:11):

“Health education is any intentional activity relating to health and disease learning, producing changes in knowledge and understanding as well as changes in attitude.”

Theoretical framework

Tones & Tilford (1994) consider health education as having the potential to clarify and influence values, promote beliefs and attitude changes, enable acquisition of personal skills and lead to healthier behaviour and lifestyle changes. This view embraces the idea that knowledge, values and behaviours/practices are important elements for effective health education. Similarly, Clément’s KVP model claims that for any individual’s “conception” three distinct dimensions are interacting: his/her “knowledge” (K), his/her “values” (V) and his/her “practices” (P) (Clément 2006).

In this chapter, we analyse teachers’ conceptions about health education according to this KVP model. The present work was carried out within the European FP6-STREP project Biohead-Citizen (“Biology, Health and Environmental Education for better Citizenship” - CIT2-CT2004-506015; Carvalho *et al.*, 2004). For this project, we surveyed future and current teachers’ conceptions about health and health education in 16 countries and examined differences in these conceptions with regard to several influential parameters such as country, religion, level of religious belief, level of religious practice, political views, and teachers’ academic degree. We discuss how understanding these teachers’ views help inform future health policy at a global level.

Methodology

The questionnaire we used for the survey was designed by all the research teams of the Biohead-Citizen Project and included questions directed at exploring knowledge on biology, health and environmental education as well as personal information. The original English version was translated into each national language and after validation of the translation it was pre-tested before implementation in each country.

Six samples were collected in each of the 16 contributing countries: in-service (In) and pre-service (Pre) teachers of primary school (Ps) and of secondary schools (Ss) in biology (B) and national language (L). The convenience samples were the university students (Pre-PS, Pre-B and Pre-L) of each country team institution and the teachers (In-PS, In-B and In-L) were those working in schools nearby the universities.

The overall corpus included 6377 respondents. The number of respondents in Europe were (from West to East): 350 from Portugal (PT), 732 from France (FR), 559 from Italy (IT), 198 from Malta (MT), 365 from Germany (GE), 311 from Poland (PL), 334 from Hungary (HU), 273 from Romania (RO), 316 from Lithuania (LI), 182 from Estonia (EE), 306 from Finland (FI) and 322 from Cyprus (CY). From African countries, the following numbers responded (West to East): 324 from Senegal (SN), 330 from Morocco (MA) and 753 from Tunisia (TN). From the Middle East country, Lebanon (LB), 722 responded.

We included 17 questions on health education and 14 questions on the socio-political context; most asked respondents to select one point in four possibilities coded from 1 to 4, from “I agree” to “I disagree”, in a Likert scale.

We used multivariate analysis as the method for analysis. Statistical multivariate analysis has become a standard in investigating complex data featuring the behaviour of many individuals, according to many variables (Lebart *et al.*, 1995). To analyse the health education answers, we used the principal component analysis (PCA, Lebart *et al.*, 1995). We further performed a between group analysis (Dolédec & Chessel, 1987) to complement the initial PCA (which differentiated all the individuals) to show the differences between groups’ conceptions (groups of countries, samples of teachers, level of training, religions, and faith). We used the Monte Carlo test to analyse the levels of significance differences between groups.

Results

Among the several axes of values recognized in the field of health education (Carvalho & Carvalho, 2005) we focused this work on the axe “biomedical model” – “health promotion”. Our results show significant differences among teachers in the 16 **countries** regarding their approach towards the biomedical model (BM) and health promotion (HP) model, when codes 1, 2, 3 and 4 are analysed separated ($X^2 = 904.1$, $df = 45$, p value $< 2.2 \times 10^{-16}$). Grouping the codes 1+2 of BM and grouping the codes 3+4 of HP, the differences among countries respondents are also significant ($X^2 = 665.5$, $df = 15$, p value $< 2.2 \times 10^{-16}$). This distribution of BM/HP in each country is shown in Figure 1, where Tunisia is strongly BM (90.0% BM / 10.0% HP) whereas Lithuania (33.5% BM / 66.5% HP) and Finland (33.6% BM / 66.4% HP) are close to the health promotion pole.

The northern countries of Finland, Lithuania and Hungary as well as Cyprus (with strong British influence) are closer to the health promotion view, whereas the Central European countries, Romania, France, Germany and Poland, as well as Tunisia (with strong French influence) are closer to the biomedical model perspective.

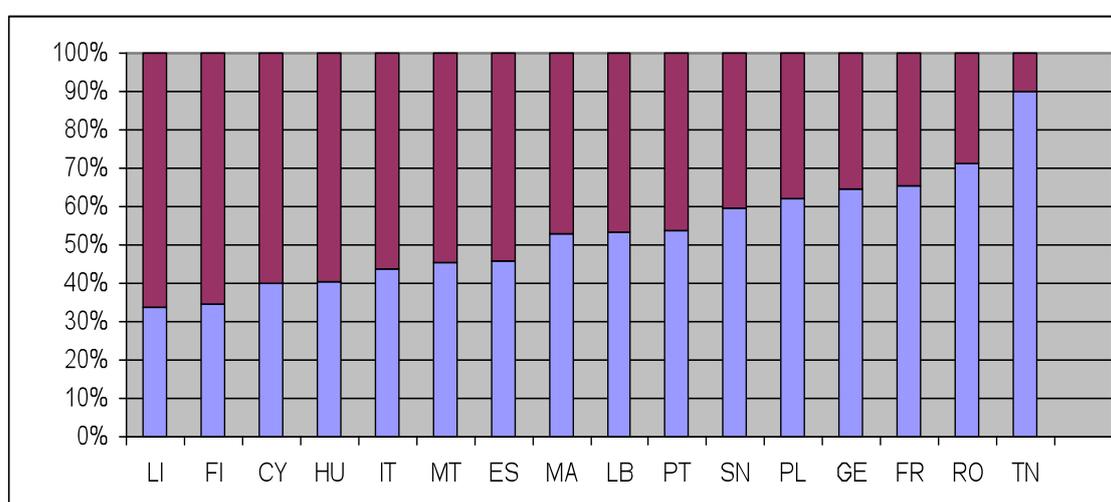


Figure 1. Percentage of BM (blue) and HP (pink) answers in the 16 countries. Numbers represent BM percentages.

In addition, the statistical analysis showed that the conceptions of the biomedical model and health promotion are more associated to the countries rather than to the respondents' **religion** (question P13). However significant differences ($X^2 = 149.3$, $df = 3$, p value $< 2.2 \times 10^{-16}$) were also found, showing Christians closer to the health promotion pole than the Agnostics or the Muslims. The latter are more associated to the biomedical pole.

Significant differences ($X^2 = 35.7$, $df = 4$, p value = 3.246×10^{-07}) are also found in the **religious practice** (question P12), and results show that those that practice their religion more are closer to health promotion than those that do not.

These results altogether indicate that the country effect is stronger than the religious effect as far as the biomedical model and health promotion conceptions are concerned: for instance Poland and Romania are Christian countries, but in the biomedical pole. In the Muslim countries, Tunisia is more biomedical than Morocco. We also analysed how the conceptions on the biomedical model and health promotion are associated to the **groups of teachers** (question P1): in-service (In) and pre-service (Pre) teachers, of primary school (Ps) and of secondary schools, in biology (B) and national language (L). There are statistical differences among the teachers' groups ($X^2 = 55.5$, $df = 5$, p value = 9.903×10^{-11}) and results show that the primary school teachers, both

pre-service (Pre-PS) and in-service (In-Ps), are more associated to the health promotion pole than all the secondary school teachers: pre-service biology (Pre-B), in-service biology (In-B), pre-service language (Pre-L) and in-service language (In-L) teachers.

The effect of the **level of teachers' training** in both conceptions of the biomedical model and health promotion was also investigated (question P5). Since only a few respondents were included in code 1 (secondary education), this was amalgamated with code 2 (university 1-2 years). Thus, for the analysis we have four groups (Fig.2): P5.1. "secondary education + university 1-2 years"; P5.2. "university 3-4 years"; P5.3. "university 5-6 years" and P5.4. "longer education". Significant differences were found among groups ($X^2 = 60.5$, $df = 4$, p value = 2.2×10^{-12}), and Figure 2 shows that the higher the level of university (or high school) training the closer teachers are to the health promotion approach.

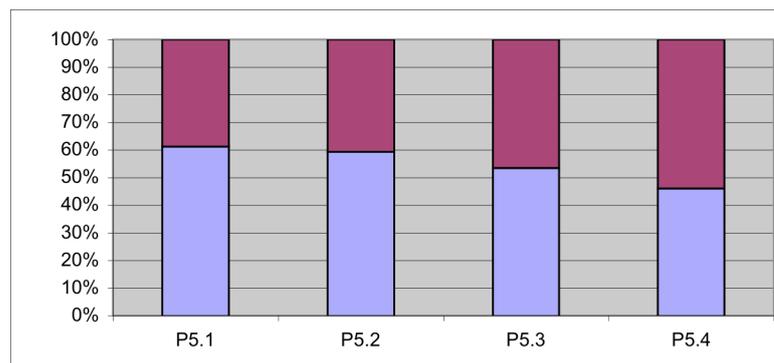


Figure 2. Percentage of BM (blue) and HP (pink) answers in each group of teachers' training level.

Numbers represent BM percentages.

P5.1 - "secondary education + university 1-2 years";

P5.2. "university 3-4 years";

P5.3. "university 5-6 years";

P5.4. "longer education".

We further analysed the effect of the respondents' **childhood environment**, *i.e.* where teachers and future teachers lived in their infancy: question P14. "rural countryside", "town, small city", "centre of a large city" and "suburbs of a large city"). No significant differences were found between groups ($X^2 = 5.3$, $df = 3$, p value = 0.148) indicating that the childhood environment is not relevant for the persons' perception of health education. This result reinforces the previous finding regarding the great importance of the individual's training to become increasingly aware of the wider perspective of health education, *i.e.* towards the health promotion perspective.

"**Autocratic/Democratic**" is another important axis in health education (Carvalho & Carvalho, 2005). In this study, we asked if the statement "Only a strong central power can put some order in my country" (question A42) could be correlated to the biomedical model and health promotion conceptions. The differences are significant ($X^2 = 25.9$, $df = 3$, p value = 9.9×10^{-6}) and results show that those respondents that are for a central power (codes 1+2) are closer to the biomedical model rather than the health promotion approach. This is an interesting expected result since the biomedical model is characterised by the leadership of the health professionals whereas individual empowerment underpins the health promotion approach (Jones & Naidoo, 1997; Katz and Peberdy 1997; Ewles & Simnett, 1999; Carvalho, 2002, 2006; Carvalho & Carvalho, 2006).

Further analysis of health education conceptions in 12 countries: multivariate analysis

Most of the health education questions were included in part B of the questionnaire. Only 12 countries applied both parts A and B of the questionnaire in a total of 5187 respondents: Portugal (PT), France (FR), Italy (IT), Hungary (HU), Romania (RO), Estonia (EE), Finland (FI), Cyprus (CY), Senegal (SN), Morocco (MA), Tunisia (TN) and Lebanon (LB) (see "IV. Methodology" for the number of respondents per country).

The analysis carried out in this section concerns 4 questions of the questionnaire A (A55, A63, A67, A68) and 13 questions of the questionnaire B (B1, B2, B6, B9, B12, B15, B16, B21, B22, B23, B25, B26, B27) making a total of 17 questions, which were applied to 5187 individuals of the above 12 countries. Similarly, we also analysed the following socio-political questions: A15, A29, A26, A34, A37, A42, A48, A51 and P6 to P11.

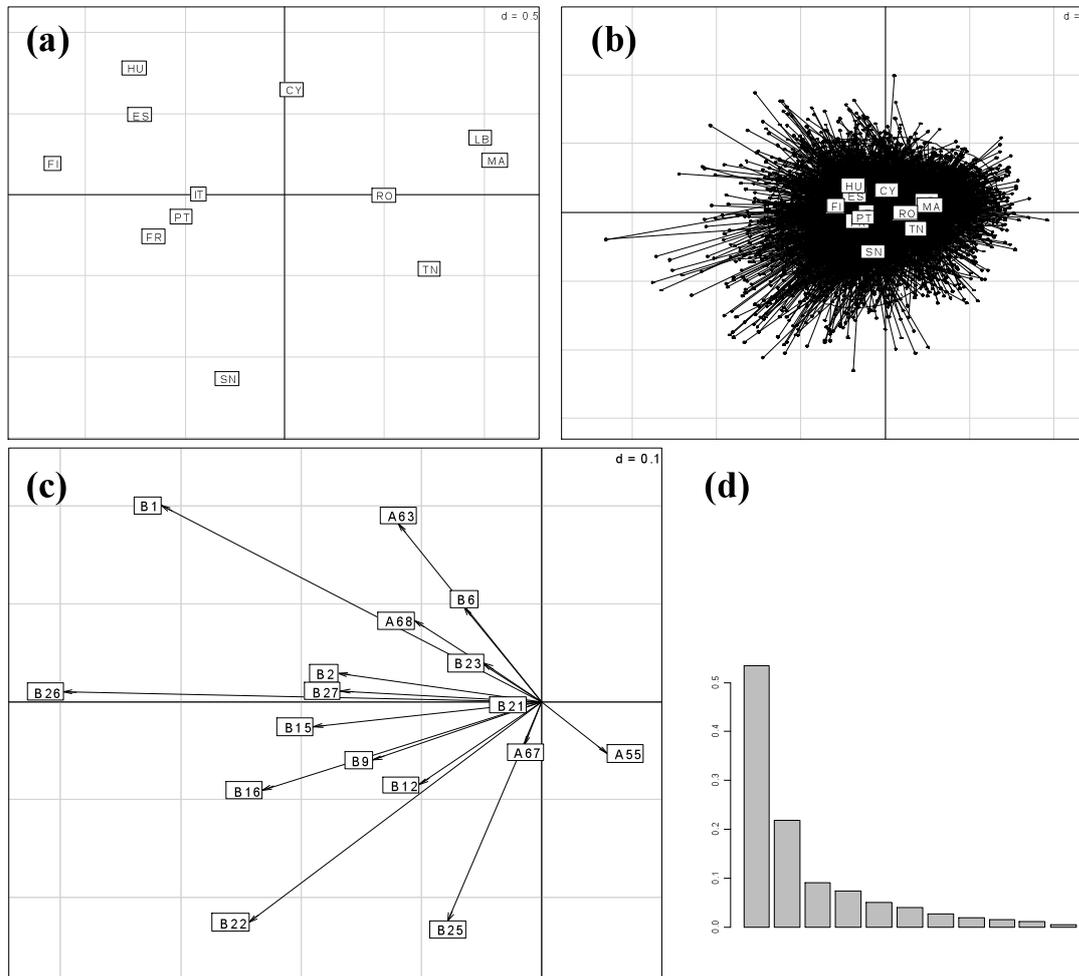


Figure 3. Between analysis applied to Countries.

(a) and (b) show the position of the gravity centre of each country on the F1-F2 axis. In (b), each point is a person, linked to the gravity centre his/her country. An ellipse is surrounding the 2/3 persons of each country. The name of countries may be sometimes hidden, but it can be read on (a) which shows the same information but enlarged.

(c) Answers to questions are represented by vectors, where the arrow corresponds to the higher code of the question (4 – “I disagree”, see “2.Methodology”). The arrow position indicates the contribution of this question to each axis, by vector projection on either axis.

(d) Histogram of the eigenvalues, expressed as percentage of the variance of successive components. The two major components constitute the two axes of charts (a), (b) and (c).

Figure 3 represents the between country analysis, where it is possible to see that axis F1 is strongly structured by the questions (by decreasing importance, as observed in Figure 3):

B26: “Health education at school mainly involves developing the personal skills of pupils such as self esteem or stress management”;

B1: “Health education at school improves pupil behaviour”;

B22: “Teachers should not be obliged to teach health education if they do not feel confident”;

B16: “I should use olive oil more often in my food”

Questions B26, B1 and B22 are related to school health education aims, which characterises the F1 axis.

The axis F2 is structured not only by the above B1 and B22, but also by the questions:

B25: *“I should eat more fresh vegetables”*.

A63: *“Health can be seen in several perspectives”* (see Appendix)

Charters (a) and (b) of Figure 3 show that Finland, Estonia and Hungary (and, to a lesser degree, France, Portugal and Italy) respondents are not associated to the idea that school health education should provide pupils’ personal skills (B26) or improve pupils’ behaviour (B1). In contrast, the non-European respondents from Morocco, Lebanon and Tunisia (and, in a lower degree, Romania) are in favour of developing these pupils’ skills.

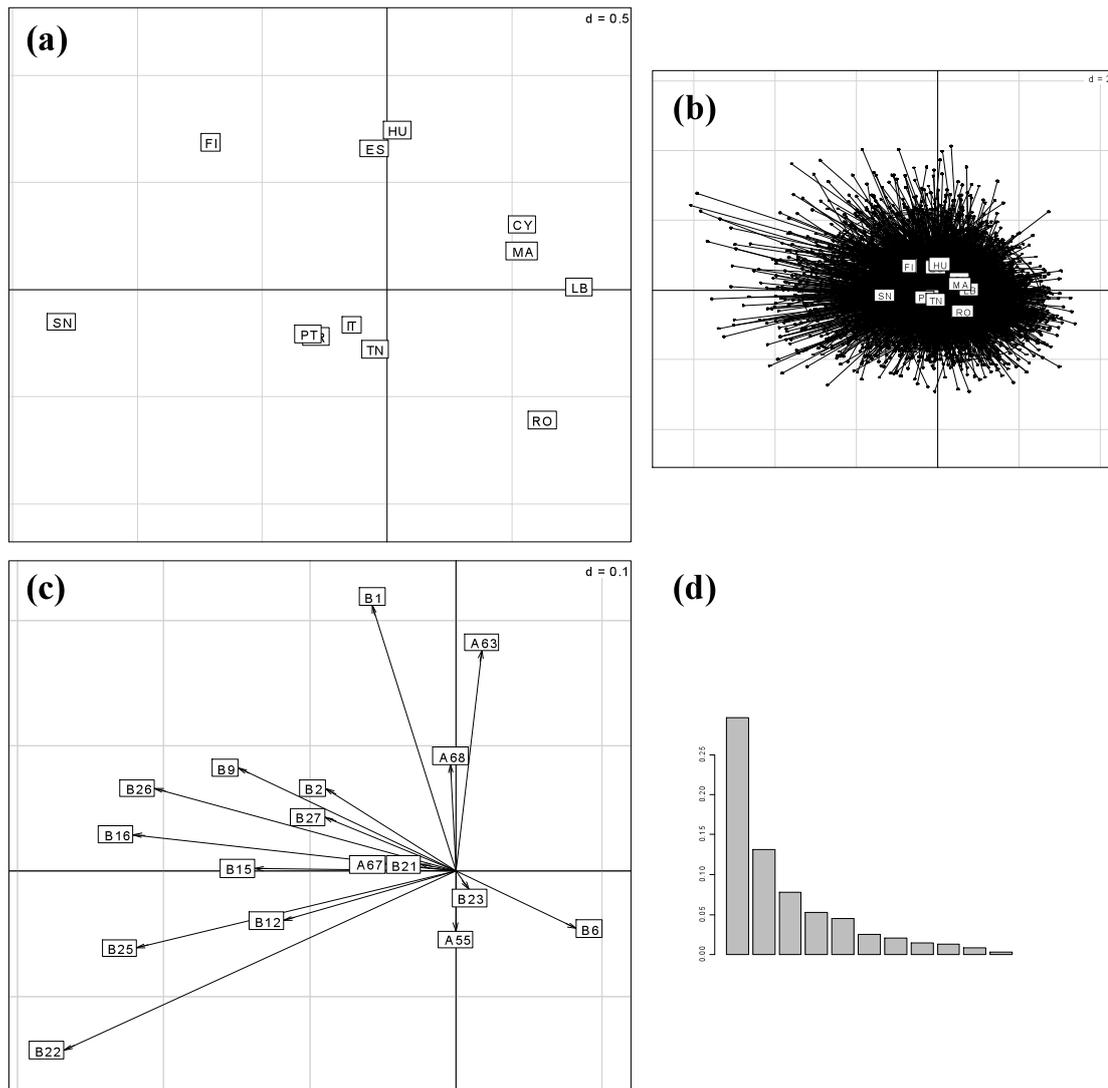


Figure 4. Between analysis applied to *Countries* after suppression of the effect of the variable religion by orthogonal PCAIV

(a) and (b) show the position of the gravity centre of each country on the F1-F2 axis. In (b), each point is a person, linked to the gravity centre his/her Country. An ellipse is surrounding the 2/3 persons of each country. The name of countries may be sometimes hidden, but it can be read on (a) which shows the same information but enlarged.

(c) Answers to questions are represented by vectors, where the arrow corresponds to the higher code of the question (4 – “I disagree”, see “2.Methodology”). The arrow position indicates the contribution of this question to each axis, by vector projection on either axis.

(d) Histogram of the eigenvalues, expressed as percentage of the variance of successive components. The two major components constitute the two axes of charts (a), (b) and (c).

The distribution of countries obtained with the Religion effect (Figure 3) or without it (Figure 4) is somehow similar, although showing some differences. In both Figures 3 and 4, Finland, Estonia and Hungary are opposite to the other countries (axis F2, mainly due to questions B1 and A63). However, without religion (Figure 4), a new opposition is emerging through the axis F1 as compared to Figure 3: Cyprus joins the other Mediterranean countries (Lebanon, Morocco); Tunis joins the Latin countries (Portugal, Italy, France) and Romania (central Europe) is contrasting with Senegal (Western Africa). The latter is mainly due to question B22 where Senegal is against “*Teachers should not be obliged to teach health education if they do not feel confident*” as well as against the idea of needing to eat more fresh vegetables (B25) and olive oil (B16).

These results are in agreement with the above analysis (item 5.1) where we noticed that the effect of Countries on health education questions was stronger than the one of Religions.

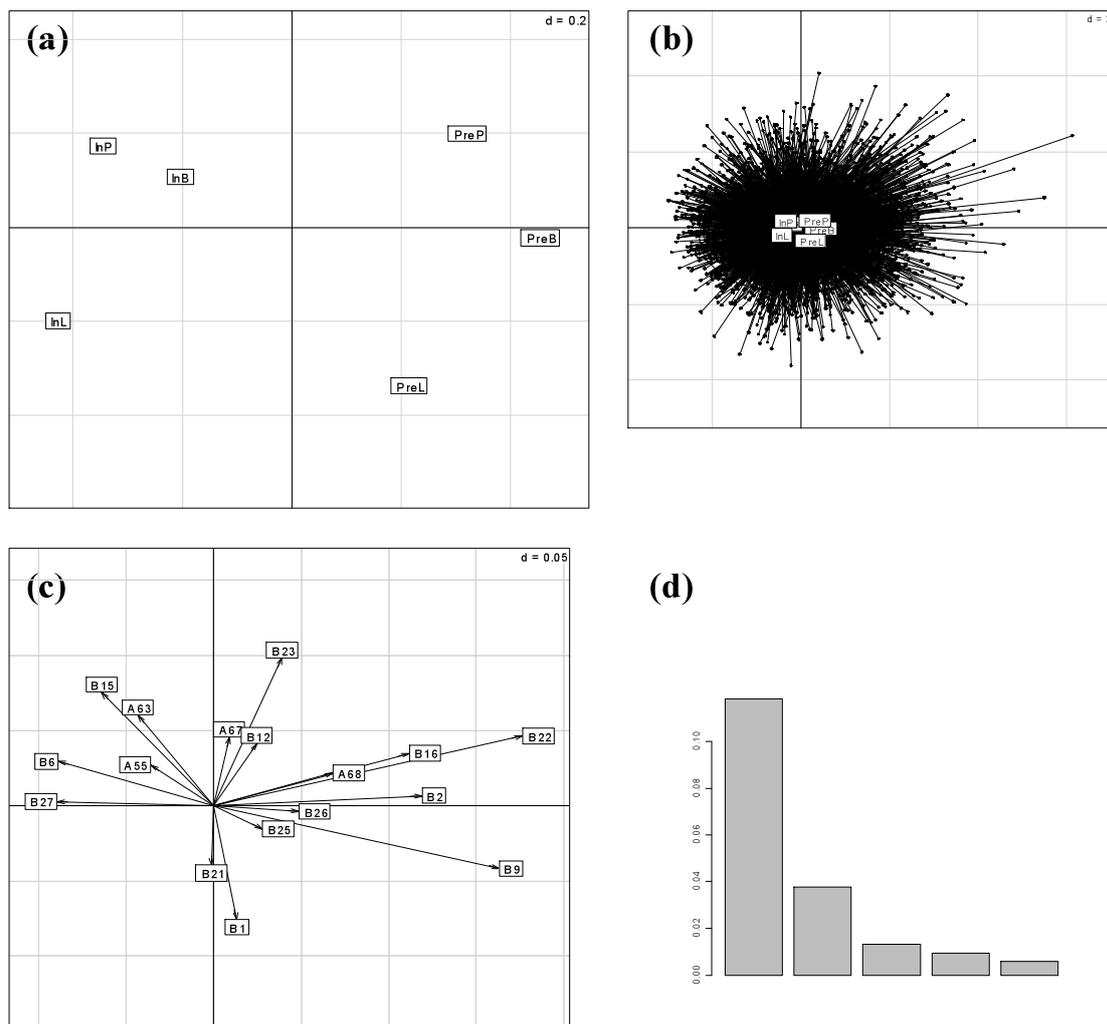


Figure 5. Between analysis applied to *Groups of teachers*.

- (InP = In-service primary school teachers;
- InB = In-service biology teachers;
- InL = In-service language teachers;
- PreP = Pre-service primary school teachers;
- PreB = Pre-service biology teachers;
- Pre-L = Pre-service language teachers.

For further information see legend to Figure 3.

Figure 5 represents the between analysis on groups of teachers, where it is possible to see that axis F1 is strongly structured by the following 4 questions, two related to implementing health

education and the other two concerning healthy food:

B22: “Teachers should not be obliged to teach health education if they do not feel confident”;

B09: “I would like to eat less meat”;

B27: “It is exclusively the family’s responsibility to deal with health education”;

B06: “It would be good to put more fat in my food”.

The F2 axis is structured by the following questions, one associated to policies and the other with the role of health education:

B23: “Schools have to take into account public health policies”;

B01: “Health education at school improves pupil behaviour”.

All the in-service teachers of primary school (InP), of biology (InB) and of language (InL) are clearly separated, along the Axis F1, from all pre-service teachers of primary school, biology and language, respectively PreP, PreB and PreL. The results show that pre-service teachers think that health education should be taught at school, not only by the families, and that teachers should be obliged to teach it even if they do not feel confident in doing it. In contrast, teachers with teaching experience are more defensive in this respect, assuming exactly the opposite.

Comparing to biology (PreB and InB) and primary school teachers (PreP and InP), both language pre-service teachers and in-service teachers (PreL and InL) are more in favour that schools take into account public health policies (B23) and they do not believe that health education improves pupils’ behaviour (B1).

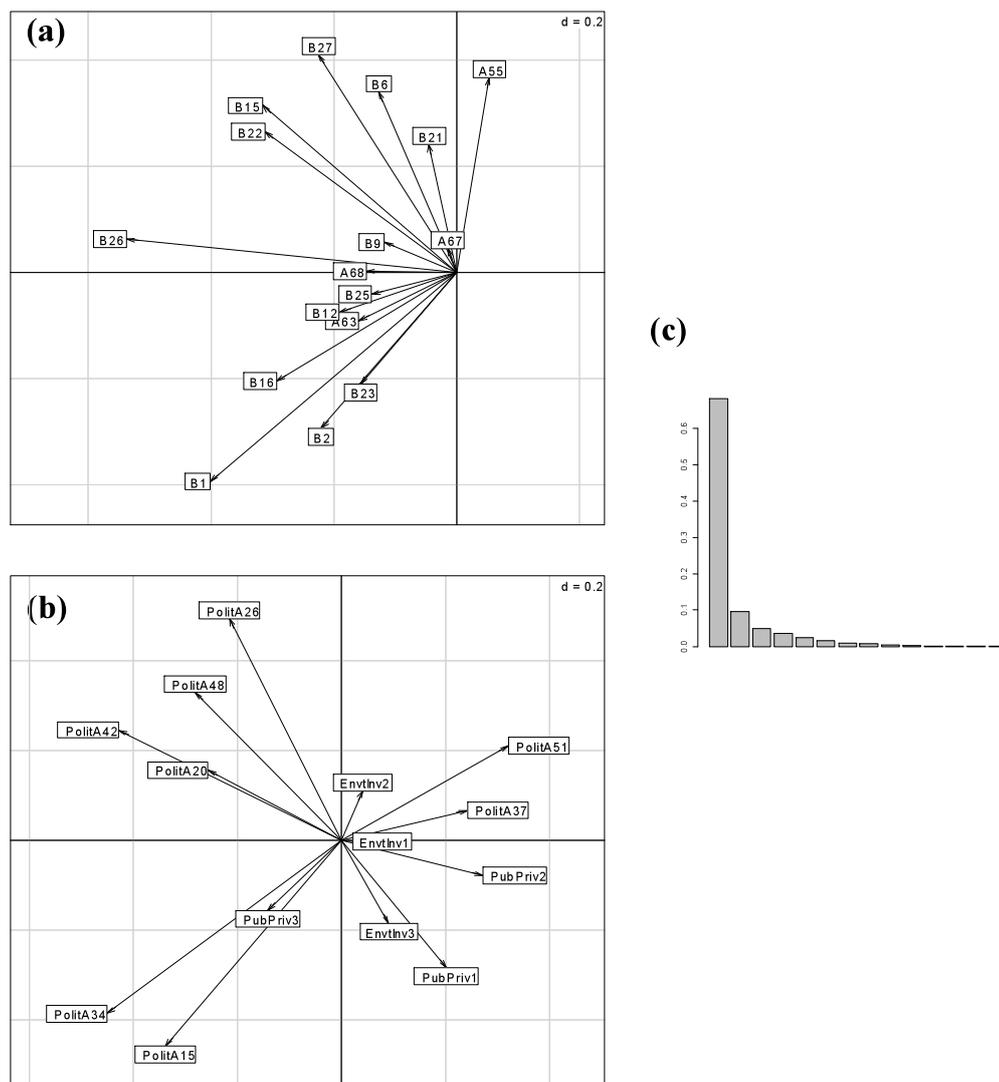


Figure 6. Co-inertia analysis applied to *Health education variables (a)* and to *Political variables (b)*.

The co-inertia analysis (Figure 6) allows maximizing the correlations between differences in health education conceptions and the differences on political views. This correlation is maximal at the axis F1 (Figure 6-c). The main questions that structure this axis F1 are again (chart (a) of Figure 6):

B26: *“Health education at school mainly involves developing the personal skills of pupils such as self esteem or stress management”*;

B01: *“Health education at school improves pupil behaviour”*;

And also:

A63: *“Health can be seen in several perspectives: ...”*. (See Annex).

A68: *“If possible, we should walk more instead of using cars because...”*. (See Annex).

The chart (b) of this Figure 6 shows that this axis corresponds to the following political positions:

A34: *“The government must make laws favouring the creation of firms to stimulate our economy”*;

A42: *“Only a strong central power can put some order in my country”*.

And also:

A51: *“Science and religion should be separated”*.

A37: *“Religion and politics should be separated”*.

In contrast, the questions concerning teachers' involvement in environmental protection activities (P6, P7, P8) have little influence in structuring this axis F1, indicating that their practices in such activities is not associated to their health education and political perspectives.

The critical questions concerning health education in school (Figure 6-a), especially improving pupils' personal skills and self-esteem (B26) and improving pupils' behaviour (B1) correspond to an equivalent political point of view (Figure 6-c) of creating firms to stimulate the economy (A34) and a strong central power to put order in the country (A42). On the other hand, both questions related to health promotion (A63, A68) can be correlated to both political perspectives of separation between science and religion (A51) and separation between religion and politics (A37).

In other words, the teachers' views about improving pupils' personal skills (B26, B1) being correlated to their views about a strong central power promoting enterprises setting up to develop the country economy (A42, A34) suggests that teachers' health education perspective seeks to promote individual empowerment for both self-development and economic development.

Conclusions and policy implications for the future

The fact that the primary school teachers are closer to the health promotion pole than the secondary school teachers is a very interesting finding as it is in agreement with our previous study on textbooks (Carvalho et al., 2008) showing that, likewise, primary school textbooks of the 16 countries are more linked to the health promotion concept than the secondary school textbooks.

Authors and publishers of all these countries seem to have a similar perspective in that for earlier years the textbooks must be more devoted to pupils' good health and healthy habits whereas for older ages the textbooks must give more emphasis to the transmission of knowledge about diseases (pathologic), treatments (curative) and disease prevention (preventive) in order to make young people aware of unhealthy habits. Similarly, teachers' conceptions gathered in this study indicate that not only the authors and publishers (Carvalho et al., 2008) but also teachers and future teachers see health promotion as a perspective for health education more appropriate in primary school than in secondary school.

The emphasis on the health promotion perspective, rather than the biomedical model, is a matter that should be taken into account in the countries' national programmes/syllabuses as well as in teachers' training. In fact this study has shown that higher level of teachers' training contributes

to make them to look at health education in a wider perspective rather than in the narrow view of the biomedical model, as previously found in other different studies (Jones & Naidoo, 1997; Katz and Peberdy 1997; Ewles & Simnett, 1999; Carvalho, 2006; Carvalho & Carvalho, 2006).

In contrast to northern European countries, teachers from non-European countries were shown to agree that school health education should provide pupils' personal skills and improve pupils' behaviour. At first sight, these are unexpected findings since several data have shown that the European countries, in particular the northern countries (Finland, Hungary, Estonia), have a traditionally closer approach to health promotion (Carvalho et al., 2008), where the pupils' personal skills are being developed. Therefore the present results deserve further investigation to understand if these teachers' answers are associated with what it is really carried out in their country schools or, alternatively, it is what they think should be done, in contrast to what is actually being implemented in schools. This is to say that the respondents of European countries (especially the northern ones) would like to see health education to include more biomedical information whereas the non-European respondents would like to see more implementation of pupils' personal skills. This is a matter for further investigation.

The study also showed that the country effect is stronger than the religion effect on health education teachers' conceptions. In contrast, the religious effect was shown to be much stronger than the country effect in similar sex education studies (Berger et al., 2009), indicating that the values associated with religion have more influence in sex education views than in health education. Therefore, it seems that the socio-political history of the country may play a major role in teachers' conceptions of health education. Better clarification of the socio-cultural and political factors influencing the teachers' conceptions about health education and sex education are a matter for ongoing analysis.

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education.									agree
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QUESTIONNAIRE 'P' : (Personal information, also anonymous)

P1. You are: (to be adapted by each team)

- A Student training to become a Primary School teacher (pupils less than 11-12 years old)
- A Student training to become a Secondary School teacher (students from 12 years old to 18 years old)
- An in-service Primary School teacher
- An in-service Secondary School teacher

If you are at the Secondary level, what subject matter do you teach: Biology only Biology and other

National Language National Language and other

Other (specify): _____

P5. What is your highest level of education?

- Secondary education University 1-2 years 3-4 years 5-6 years
- longer (specify) _____

P12. (Tick one box in EACH line):

I believe in God	<table border="1" style="width: 100%; height: 15px;"> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>						I don't believe in God	
I practise religion	<table border="1" style="width: 100%; height: 15px;"> <tr><td></td><td></td><td></td><td></td><td></td></tr> </table>						I do not practise religion	

P13. Are you? (tick only ONE box):

- Agnostic/Atheist
- Christian:* Catholic Protestant Orthodox Other (specify): _____
- Moslem:* Sunnite Shiite Druze Other (specify): _____
- Jewish
- Other religion/belief (specify): _____
- I don't want to answer

P14. In which kind of environment did you spend most of your childhood?

- Rural countryside Town, small city Centre of a large city Suburbs of a large city