

Part 9
Strand 9
Environmental, health
and outdoor science education

Co-editors: Marianne Achiam & Graça Carvalho

CONTENTS

Chapter	Title & Authors	Page
147	Introduction to Strand 9 <i>Graça Carvalho & Marianne Achiam</i>	1206
148	2-MEV-model: Individual green attitude-sets over the years <i>Bogner, Franz X. & Johnson, Bruce</i>	1207
149	Narrative analysis of a particle accelerator in the context of museum mediation <i>Séverine Derolez, Philippe Loutesse & Françoise Khantine-Langlois</i>	1214
150	Furry lizard and sneaking frog – students’ conceptions about amphibians and reptiles <i>Zofia Sajkowska & Eliza Rybska</i>	1224
151	A school garden as an location of health education: Green cheers you up <i>Carolin Retzlaff-Fürst</i>	1236
152	Graduate students define and redefine informal science education <i>Patricia G. Patrick</i>	1241
153	Leading secondary school students to face the disciplinary, epistemological and societal challenges of climate change <i>Giulia Tasquier</i>	1251
154	Analysis and improvement of health education knowledge of students at a Spanish prison <i>Agustín Pozo Tamayo, Florentina Cañada Cañada & Javier Cubero Juárez</i>	1263
155	Visitor experiences during a science-themed community event <i>Jennifer Idema & Patricia G. Patrick</i>	1270
156	Designing and testing an education for sustainable development self-efficacy scale for pre-service teachers: Preliminary findings <i>George Malandrakis, Penelope Papadopoulou, Costas Gavrillakis & Athanasios Mogias</i>	1280

Chapter	Title & Authors	Page
157	European health literacy scale (HLS-EU-BR) applied in a Brazilian higher education population of Rio Grande do Sul (RS) <i>Graça S. Carvalho, Maria Cristina Pansera Araújo, Eva T. O. Boff, Rosa Branca Tracana & Luís Saboga-Nunes</i>	1289
158	Critical assessment of the popularisation of science in Brazil <i>Danilo Rothberg & Felipe Conrado Fiani Felipe de Sousa</i>	1296
159	Students' mental models of human nutrition <i>Aurelio Cabello Garrido, Enrique España Ramos & Ángel Blanco López</i>	1305
160	Ecosystems and geochemical cycles in Portuguese textbooks of two historical periods <i>Rosa Branca Tracana & Graça S. Carvalho</i>	1312
161	Environmental issues in the Italian universities: Possible developments in the light of the international debate <i>Emilio Balzano & Marco Serpico</i>	1319
162	Sex education in Portuguese basic education: An action-research including teachers and students <i>Zélia Anastácio & Susana Marinho</i>	1326
163	Sustainability and science education: Modes of pedagogic practice <i>Allyson Macdonald</i>	1334
164	Nutrition education in primary schools: The “food wheel” and food pyramid <i>Denise Orange Ravachol & Susan Kovacs</i>	1346
165	Comparing the effects of enjoyment on environmental awareness and responsibility across countries <i>Fatih Çağlayan Mercan</i>	1356
166	Perceptions and attitudes of students towards education for sustainable development <i>Anthoula Maidou, Katerina Plakitsi & Hariton Polatoglou</i>	1366

Chapter	Title & Authors	Page
167	The notion of praxeology as a tool to analyze educational process in science museums <i>Juliana Bueno & Martha Marandino</i>	1378
168	Identifying the gap in courses on sustainable development offered by Greek universities <i>Eleni Chita, Achilles Kameas, Athina – Christina Kornelaki, Katerina Plakitsi, Vagelis Kolios & Anthoula Maidou</i>	1385
169	Are you aware of the danger of household cleaners? - Science Environment Health <i>Ayla Cetin-Dindar</i>	1397
170	University professors' views of their role in/for sustainable universities <i>Athina – Christina Kornelaki, Katerina Plakitsi, Vagelis Kolios & Anthoula Maidou</i>	1407
171	Science through education from teachers to sustainable future <i>Jarkko Lampiselkä & Noora Kivikko</i>	1416
172	Cultural-historical activity theory as a means to implement Science/Health/Environment pedagogy <i>Mavrikaki, E., Skordoulis, K. & Halkia, K.</i>	1426
173	It's not just seizures: Improving student's knowledge and attitude concerning people with epilepsy <i>Uwe K. Simon, Lisa Gesslbauer & Andreas Fink</i>	1434

SEX EDUCATION IN PORTUGUESE BASIC EDUCATION: AN ACTION-RESEARCH INCLUDING TEACHERS AND STUDENTS

Zélia Anastácio¹ and Susana Marinho²

¹ CIEC, Institute of Education, University of Minho

² CIEC, Institute of Education, University of Minho

Abstract: This research aimed to identify teachers' and adolescents' attitudes and conceptions towards school based sex education (SE). The main purpose of our study was to develop teachers' skills to approach sex education in order to promote a healthy sexuality for their students. The methodology selected was an action-research following three stages: diagnostic phase, intervention phase and evaluation phase. For diagnostic stage we developed a questionnaire for the first, second and third cycle of basic education teachers of Oporto schools. We carried out the questionnaire in order to fit it to our methodology and we validated it doing a pilot study. Questionnaire was filled in online and results were processed with SPSS statistical program. The same methodology was carried out to analyse the conceptions of second and third cycle of basic education students attending an Oporto school. We started the intervention phase with a training program for teachers about school based sex education. Then some of these teachers implemented a set of structured SE activities with their students. The evaluation phase consisted on a focus group with the intervenient teachers and on the application of a questionnaire to the students that participated in the SE activities. The results reveal that after the intervention phase teachers felt more confident, more secure and better prepared to implement projects about SE and attributed greater importance to their role as sexuality educators. The students acquired a more comprehensive concept of sexuality. They also developed more positive attitudes about the role of SE in the development of children and youth, as well as their confidence in school about the role it plays in relation to the SE increased. Some gender differences were also attenuated.

Keywords: Sex education, action-research, conceptual change

SEXUALITY EDUCATION AT SCHOOL

The promotion of children' and adolescents' sexual and reproductive health is an important contribution to their personal and social development. As young people spend most of their time at school, this institution is a privileged place for the implementation of the sex education projects. In Portugal several health programs have been developed in schools, with special emphasis on Sexuality Education (SE), which is compulsory from elementary to secondary school levels according to the last law (Law n.º 60/2009) that explain the purpose of SE. Also international guidelines has been considered to support these interventions, namely the *International Technical Guidance on Sexuality Education – an evidence informed approach for schools, teachers and health educators* (UNESCO, 2009) and the *Standards for Sexuality Education in Europe – a framework for policy makers, educational and health authorities and specialists* (OMS, 2010).

However, as Anastácio (2007) had observed before, despite all the legal and ministerial guidelines, teachers continue to resist to the approach of SE in schools. Having done her

research with primary schools teachers the author identified that, in this group of teachers, who have specific training in sex education and/or health education, have less experience and are younger feel more at ease to approach sex education in schools. On the other hand, Cohen et al. (2012) verified that teachers who demonstrate greater willingness to teach SE are more likely to be teaching middle school, have less teaching experience, have received training to teach SE, feel more knowledgeable about sexual health, and view broad-based SE as more important.

Considering the factors of success, Poobalan and colleagues (2009) suggest that more effective interventions are those developed with younger students; before they become sexually active; adjusted to the biological and psychological development of young people; not only promote abstinence, but also develop and train relational skills; are linked to the services that provide diseases prevention' and contraceptive methods; include several sessions over time; use interactive activities; and have educators with appropriate training.

In view of this theoretical framework, we have the following research questions:

- What are the attitudes and conceptions towards school based sex education of first, second and third cycle of basic education teachers?
- What are the needs expressed by the Portuguese students regarding their sexuality education?
- Can a plan of skills development modifies the conceptions of teachers and students about sexuality and sex education?

METHOD

The present research aimed to identify basic education teachers' and students' attitudes and conceptions towards school based sex education (SE). The main purpose of our study was to develop teachers' skills to approach sex education in order to promote a healthy sexuality for their students and to verify its effectiveness near the adolescents. Implementing a training program, the method used in this project was the action-research. The study was developed in three phases: diagnostic, intervention and evaluation.

Diagnostic phase

To identify teachers' attitudes and conceptions about sex education at school we developed a questionnaire to be applied to teachers of all cycles of Portuguese basic education in Oporto schools. We chose to carry out our own questionnaire in order to fit it to our methodology and we validated it doing before a pilot study. They filled in the questionnaire online as well as the definitive convenience sample.

The questionnaire was answered by 135 teachers (102 females and 33 males). The teachers' average age was 41.79 years. The average in-service years was 16.63 (minimum = less than a year; maximum = 37 years).

Collected data was processed with the SPSS software (version 21.0). After a descriptive analysis, associations between variables were established applying: Kruskal-Wallis test, when it originate more than two groups; *T* test when we had only two groups to compare.

To identify students' conceptions and needs concerned with SE (only for 2nd and 3rd cycles of basic education) we also developed our own questionnaire that was filled in online. It was answered by 397 students (192 females; 205 males). The average age was 13 years old. Regarding the distribution of students by different school cycles/years we had: 2nd cycle - 85 students at the 5th year and 84 at the 6th; 3rd cycle - 55 adolescents at the 7th, 95 at the 8th and 78 at the 9th year.

Obtained data was processed similarly to the data obtained from the teachers.

Intervention phase

The intervention phase started with a 50 hours training course for teachers, about school based sex education.

For the students we develop a SE program applied to 6th (22 students), 7th (41 students), 8th (19 students) and 9th (39 students) grades, by their teachers. The activities were structured around three components: biological, psycho-affective and life project (Ribeiro, 2006).

Evaluation Phase

The intervention program was evaluated by a focus group with 7 teachers (1 male, 6 females) who had participated in the training course or had developed SE activities with the students.

To evaluate the program impact for the students we applied a second questionnaire, which was filled in on paper by 112 students (60 females and 52 males). Regarding the distribution of students by the different school years, 22 were in the 6th degree, 41 were studying at the 7th, 15 in 8th, and 34 were attending the 9th degree.

RESULTS

Results from teachers

In the diagnostic phase we found that the majority of the teachers inquired had no specific training neither in health nor in sex education. Only near a third of them had it.

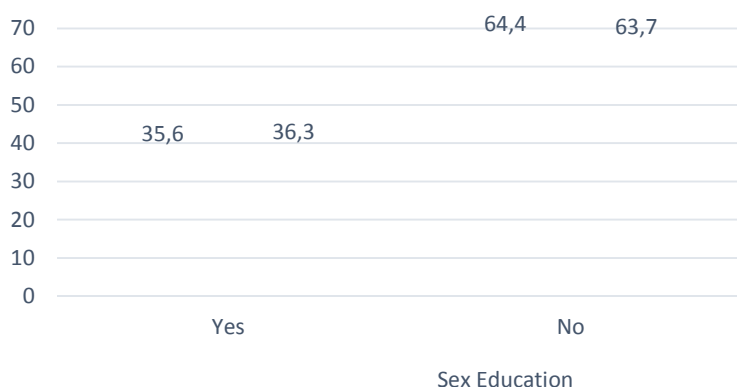


Figure 1: Training in health education and sex education (%)

We think this factor has a strong influence in the willing to address this issue with the students, since trained teachers were more willing to address it.

Regarding the obstacles to sex education, the majority of the teachers saw parents as an important obstacle to address SE with students, since the majority of them referred that their biggest fear concerned with this issue were the possibility of parents' adverse reactions. The lack of specific training in health and sex education was also one of the obstacles identified by the teachers questioned.

When we inquired the teachers, during the focus group, after the intervention program, all the teachers said that they did not face with any adverse reactions from the parents.

They agreed that the training course become them more confident, with more strategies and better prepared to implement SE activities. They also attributed greater importance to its role in sexual education, while in the diagnostic phase the majority of the teachers questioned preferred an element outside the school, like a doctor or a nurse, followed by the natural sciences teacher as the responsible persons by SE.

Some statements presented in the table 1 comparing opinions from the previous and the final focus groups can elucidate this change of conceptions:

Table 1: Teachers opinions about their role in SE in the first and the final focus groups.

Focus group before the training course	Focus group after the training course and intervention
<i>They do not start by the basis. They start from the roof. Because they impose. It is X hours for this and X hours for that and the basis is not this, isn't it? The base is in fact know how to work with every age level and people having training for that. That's what for me is the basis.</i>	<i>For me the positive aspects (of the training) was that really allowed me a space and a time of reflection on the subject and to find materials and strategies. In this aspect, I think it was positive.</i>
(Female teacher of Natural Sciences, 2 nd Cycle)	(Female teacher of Natural Sciences, 2 nd Cycle)
<i>But I also think that it is no more training actions on the subject to do that I'm going to be the best person to talk about it.</i>	<i>Training contributed to we feel more comfortable.</i>
(Female teacher of English Language, 3 rd Cycle)	(Female teacher of English Language, 3 rd Cycle)

Results from students

In the diagnostic phase, 48.9% of the 397 students presented a concept of sexuality merely biologic, relating it to reproduction and sexual intercourse. Analysing those who answered the diagnostic questionnaire and had already participated in SE activities (n=102), 43.1% expressed a biological concept of sexuality. After our intervention program, the percentage of students who related sexuality only to biological dimension had fallen to 20.5% (table 2).

Table 2 - Comparison of students' concept of sexuality in the diagnostic phase and in the evaluation phase

	Diagnostic phase (%) n=102	Evaluation phase (%) n=112
Biological dimension	43.1	20.5
Psychological dimension	3.9	14.0
Biological and psychological dimension	14.7	35.7
Biological and social dimension	0.0	3.6
Psychological and social dimension	0.0	0.9
Biological, psychological and social dimension	2.9	7.1
No dimensions	13.7	8.0
Don't know	21.6	9.8

Comparing students' scientific knowledge before and after the intervention we can see an evolution in conceptions scientifically accepted (Table 3). More, a brief analysis considering the factors gender and age shows that girls and older students classified more correctly the statements.

Table 3: Students' Scientific Knowledge in diagnostic phase and evaluation phase (%)

	Diagnostic phase n=397		Diagnostic phase n=102*		Evaluation phase n=112	
	T	F	T	F	T	F
Fertilization is the union of two cells- one female and one male	72.5	27.5	65.7	34.3	83.9	13.4
Fertilization occurs in the vagina	49.5	50.6	39.2	60.8	33.0	65.2
Reproduction is the union of two cells- one female and one male	86.9	13.1	90.2	9.8	40.2	56.3
A woman can get pregnant during menstruation	53.7	46.3	47.1	52.9	83.9	16.1

Legend: T=True; F= False

* Students who had previously participated in SE activities

About the school role in SE, in the diagnostic phase we verified that adolescents agree with the school context for SE, with teachers as educators and with their participation in SE activities at school. However, after the intervention program, students who had participated in it agreed more than those in the diagnostic phase that school is a place where they can clarify doubts about sexuality and that teachers are able to clarify them (table 4). It seems that students developed a more positive attitude towards the role that school plays in sex education.

Table 4 – Comparison of the response means to five statements about the school role in SE

	Diagnostic phase n=397	Diagnostic phase n=102*	Evaluation phase n=112
I consider the school a place where I can clarify my doubts concerning on sexuality with confidence	2.78	2.74	3.13
Teachers know how to respond to my questions about sexuality	2.84	2.90	3.37
It is possible to approach SE in all disciplines	1.96	1.88	2.09
I would like to participate in more SE activities in school	2.68	2.87	3.06
Sex Education should be a teachers' responsibility	2.62	2.69	2.91

Scores: 1-Totally disagree; 2-Disagree; 3-Agree; 4-Totally agree;

* Students who had previously participated in SE activities

Analysing adolescents' conceptions about the role of sex education on youth development, firstly we observed that the ideas "sexuality is felt differently throughout life", "not always my friends know what is better for me" and "to talk about sexuality helps to decide" were the three with highest level of agreement. The number of students which agreed or totally agreed with these sentences increased after the intervention performed, even when compared with the responses of the students who had previously participated in SE activities (table 5).

Table 5 – Comparison of the response means to eleven statements about the role of sex education on youth development

	Diagnostic phase n=397	Diagnostic phase n=102*	Evaluation phase n=112
To talk about sexuality helps us to decide	2.99	3.00	3.36
There are different sexual orientations we should respect	3.03	3.11	3.57
Not always my friends know what is better for me	3.02	3.09	3.42
The sexual information prematurely arouses sexual behaviour	2.65	2.63	2.67
Sexuality is felt differently throughout life	3.08	3.06	3.44
Masturbation (stimulation of the genitals) is a normal practice	2.77	2.77	3.18
Sex education can help to define our personality	2.75	2.77	2.90
Sex education makes us more responsible	2.99	3.02	3.30
Sex education helps to improve communication between men and women	2.94	2.98	3.21

Sex education contributes to the promotion of equal rights and opportunities between men and women	2.94	3.00	3.29
Sex education contributes to the reduction of violence in relationships between people	2.66	2.61	3.04

Scores: 1-Totally disagree; 2-Disagree; 3-Agree; 4-Totally agree;

* Students who had previously participated in SE activities

Data analysis of the diagnostic phase, revealed that girls agreed more than boys with the idea different sexual orientations should be respected ($t=4.781$; $p<.0001$). On the other hand, boys agreed significantly more than girls that sexual information awakens early sexual behaviour ($t=-4.162$; $p<.0001$), masturbation is a normal practice ($t=-3.902$; $p<.0001$) and sex education contributes to improve communication between men and women ($t=-2.412$; $p=.016$).

Results of the evaluation phase revealed no statistically significant differences between boys and girls.

DISCUSSION AND CONCLUSIONS

In this action-research we found results according other authors. Martinez et al (2012) found that teachers prefer delegate SE to elements outside the school, as teachers of our sample. For Cohen et al (2012) the factor most frequently endorsed by teachers as a barrier to SE was anticipated reactions from parents while the factor most frequently endorsed as making teachers more willing to teach SE was their level of knowledge. For Gerouki (2009) the most important obstacles for the implementation of SE, mentioned by the teachers of her sample, were the lack of appropriate training on the subject. These factors should be considered when developing SE programs, in order to guarantee its effectiveness.

The results obtained with the students sample revealed that it is important to discuss with them the concept of sexuality, so they can acquire a comprehensive view of sexuality. It seems that the results obtained at the diagnostic phase in relation to this concept are in agreement with the observations of Allen (2007), in the United Kingdom, and of Vilar et al (2009), in Portugal, when they refer that the SE projects implemented at schools are under a preventive and medical perspective.

It seems that after the intervention, students developed more favourable attitudes about the role of SE on youth development. It also increased their confidence in school about the role it plays in relation to SE. Moreover, it seems that the intervention was able to attenuate some gender differences. Thus, the understanding of different gender conceptions and needs should lead the design of effective SE projects, contributing to student personal and social education.

Acknowledgement: This study had the financial support of the Portuguese Foundation for Science and Technology (FCT-COMPETE).

REFERENCES

- Allen, L. (2007). Denying the sexual subject: schools' regulation of student sexuality. *British Educational Research Journal*, 33(2), 221-234.
- Anastácio, Z. (2007). Educação Sexual no 1º CEB: Concepções, Obstáculos e Argumentos dos Professores para a sua (não) Consecução. Dissertação de Doutoramento. Universidade do Minho.
- Cohen, J. N., Byers, E. S. & Sears, H. A. (2012). Factors affecting Canadian teachers' willingness to teach sexual health education. *Sex Education: Sexuality, Society and Learning*, 12(3), 299-316.
- Gerouki, M. (2009). "Innovations" on hold: sex education in the Greek primary schools". *Health Education*, 109(1), 49-65.
- Martínez, J., Carcedo, R., Fuertes, A., Vicario-Molina, I., Fernández-Fuertes, A. & Orgaz, B. (2012). Sex education in Spain: teachers' views of obstacles, *Sex Education: Sexuality, Society and Learning*, 12(4), 425-436.
- Poobalan, A. S., Pitchforth, E., Imamura, M., Tucker, J. S., Philip, K., Spratt, J., Mandava, L. & Teijlingen, E. (2009). Characteristics of effective interventions in improving young people's sexual health: a review of reviews'. *Sex Education*, 9(3), 319-336.
- Ramiro, L. Reis, M., Matos, M., Diniz, J. & Simões, L. (2011). "Educação sexual, conhecimentos, crenças, atitudes e comportamentos nos adolescentes". *Revista Portuguesa de Saúde Pública*, 29(1), 11-21.
- Ribeiro, T. (2006). *Educação da Sexualidade em Meio Escolar: treino de competências individuais*. Braga: Editora Casa do Professor.
- UNESCO (2009). *International Technical Guidance on Sexuality Education. Section on HIV and AIDS - Division for the Coordination of UN Priorities in Education*. Paris: UNESCO.
- Vilar, D., Ferreira, P. & Duarte, S. (2009). A educação sexual dos jovens portugueses - conhecimentos e fontes. *Educação Sexual em Rede*, 5, 2-53.
- WHO Regional Office for Europe and BZgA (2010). *Standards for Sexuality Education in Europe – a framework for policy makers, educational and health authorities and specialists*. Cologne: Federal Center for Health Education, BZgA.