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Is it Worthwhile to Teach Computer Ethics?

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Abstract

There is a growing interest in the study and application of the ethical aspects of computing and their implications to society. Software development depends on the people who build it. The quality of the products depends, in some cases, on the developers and managers' attitudes towards the software process and some critical decisions only depend on people's ethical behaviour. This article reports part of an experience related to the students' attitudes towards the teaching of computer ethics.

1 Relevance of Computer Ethics

Social aspects of informatics are becoming more and more important as computer: are a pervasive element in our daily life. The study of computer ethics is a: important aspect in the education of future professionals. This interest is bein reinforced by the fact that when considering "software engineering as a profession" (promoted by the ACM and the IEEE Computer Society), the Code of Ethics is key element in the professionalization (see http://www.acm.org).

Some of the worries of the society involving computers only reflect the mos noticeable aspects on the use of informatics. Besides the issues of the privacy o the data and the consequences of some severe defects in software, there are ethica issues in many aspects of software development. For example, the decisions o when to stop testing, or of when to release a software product convey a certai amount of subjectivity, which can be decided by making use of ethical criteria.

Trying to transmit some basic ideas on computer ethics to the students, som academic activities were carried out for several years with the students of the la course of the B. Eng. in Informatics (5 years of education). We explain briefly th experience. All the related material can be found (in Spanish) http://www.sc.ehu.es/jiwdocoj/etica/experiencia.htm (test, questionnaire, char and histograms). Part of the experience tried to identify the best strategy f teaching computer ethics.

2 The Experience

- A questionnaire asking for the opinions of the students with respect to the course and its implications. These are the results which will be presented next. The number of people who expressed their opinion was 67 (29 women, 37 men and 1 not recorded). The data was collected in 1997 and 1998.

2.2 A questionnaire about the opinions of the students

A questionnaire (see http://www.sc.ehu.es/jiwdocoj/etica/opiniones/texto-encuesta.htm) was completed by the students, once the course on computer ethics was finished. Also, as a complement, most of the students made a research-survey on some aspects of computer ethics.

Below we describe the questions and the answers that we gathered. The y-axis of the histograms represents the percentage of responses belonging to each category of the x-axis. The categories of the x-axis are interpreted as follows:

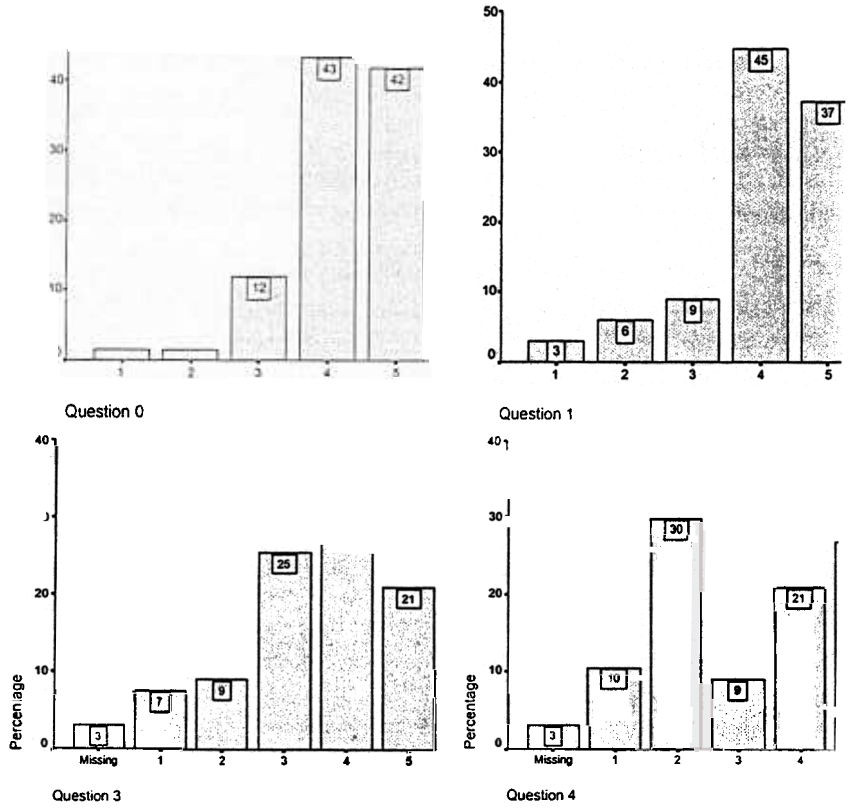
I fully agree	has a mark of **5** in the x-axis
I agree to a relative extent	has a mark of **4** in the x-axis
Neutral	has a mark of **3** in the x-axis
I disagree to a relative extent	has a mark of **2** in the x-axis
I fully disagree	has a mark of **1** in the x-axis

Let's review the questions. In general, the students value the teaching of ethics and consider them as very important in their education, as Questions 1 to 5 show.

Question 0. *In general, I have liked these lessons about the social aspects of informatics.*

Question 1. *I think that a course of this kind is unavoidable in the education of the students of informatics.*

These two questions tried to identify the need to provide computer ethics education within the curricula. The answers are positive in more than 80% of the cases.



Question 2. *I think that I will apply ethical principles to my professional life, in th future.*

The students were 15% neutral, 55% marked **4** and 28% marked **5**, therefo the attitude is positive towards acting ethically.

Question 3. *A course about the social aspects of informatics, including ethics ar law, provides more clarity in the mind when solving problems.* This question trie to detect whether confronting the students to these new topics could improve (or least generate the perception of improving) the technical skill. We have to bear mind that this course was not described in the original curriculum.

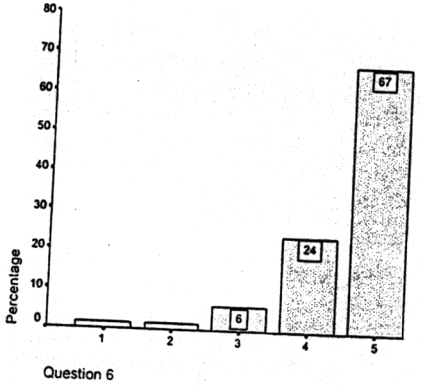
Question 4. *I think that the moral principles have been acquired during the first years of life and that it is very doubtful that those principles can be modified.*

Question 5. *This (short) course helps me to improve my reasoning.*

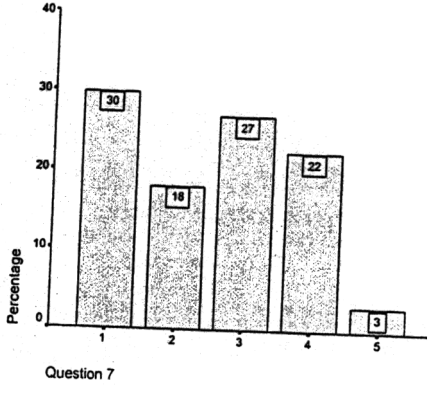
The answers were 12% for mark **2**, 19% for mark **3**, 28% for mark **4** and 30% for mark **5**.

While questions 3 and 5 corroborate the need for ethics education, question 4 shows that, probably the effect in changing attitudes will be limited. Approximately, half of the respondents considered that the effect would be limited. The answers to Question 7 confirm these limits, although Question 6 corroborates the view presented in Questions 1 to 5.

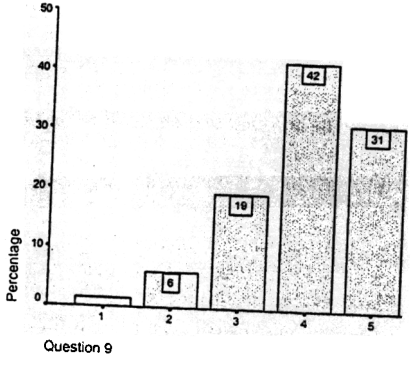
Question 6. *This short course has helped to make me conscious about some professional problems related to the computing field.* The exposure of the students to ethical and professional issues previous to the present experience was, certainly, almost null, and students have appreciated receiving this subjet.



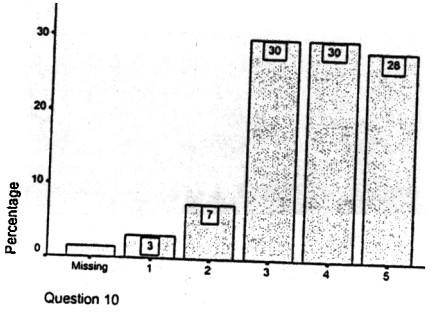
Question 6



Question 7



Question 9



Question 10

Question 7. *This short course has changed some of my personal ethical principles.* In line with the answers to question 4, the histogram depicts different opinions, divided between those who think that the ethical principles were not changed (30% for mark 1) and the minority which admits that the course has changed some of their principles (22% for mark 4 and 3% for mark 5).

Question 8. *I think that in a course or seminar about the social aspects of informatics, someone could try to impose, without any moral justification, some specific ethical values.*

The answers were 45% for mark **1**, 21% for mark **2**, 19% for mark **3**, 2% for mark **4** and 12% for mark **5**.

This question was presented only to see if the moral principles of the teacher could have caused some disturbance to the students or whether it could be some grade of imposition of principles.

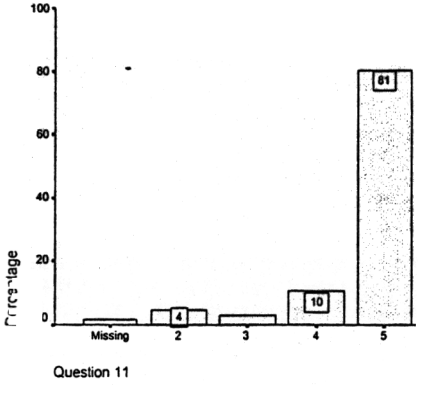
Question 9. *I think that the business environment will make me to disregard some ethical principles.*

Question 10. *In extreme circumstances I wouldn't act ethically.*

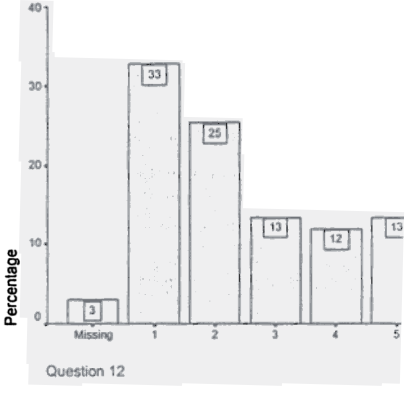
The answers to Questions 9 and 10 show how the environment will exert a great pressure on the future professionals. Although, the answers to question 10 could be understood given the generality of the question, the answers to Question 9 are worrying in the sense that, in the end, it is the "market" that sets the rules of behaviour. Question 11 reinforces this position in which the environment imposes some "fears". Nevertheless, it is important to observe that results of Question 12 indicate that students differentiate between legal and ethical issues. Most of them do not place legal aspects in front of the ethical aspects.

Question 11. *I think that many professionals will continue to act unethically, even if there is availability and awareness of professional codes, norms, laws, etc.*

Question 12. *I think that the only important thing with respect to the professional behaviour is the awareness of the law. The ethical aspect is a secondary aspect, unless it has legal consequences.*



Question 11

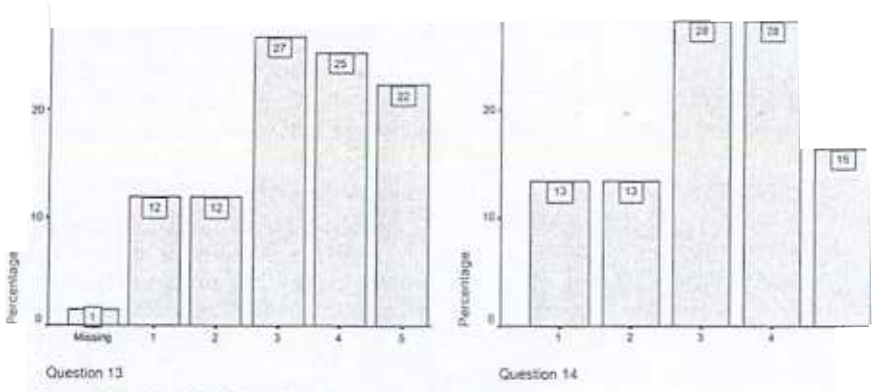


Question 12

Question 13. *I think that a manager will trust more a person who is under a code of ethics than other who is not.*

Question 14. *I think that it is easier to find a job if I declare that I act ethically in the professional environment*

Questions 13 and 14 reflect, on one hand, that ethical behaviour provides trust in the business (Question 13), but on the other hand people may be reluctant to hire workers that can think "ethically".



Question 15. *I think that this has been a short course.*

As these topics about ethics were not included in the original course this question tried to identify whether the it should be convienent to extend the course or not.

The answers are 7% for mark 1, 4% for mark 2, 39% for mark 3, 22% for mark 4 and 27% for mark 5. Part of the students (39%) responded that the length was right. Almost half of the respondents thought that this was, in fact, a short course.

Question 16. *Mark the usefulness of the following topics.*

The table below show that the topics most appreciated are the "analysis of cases" and the "professional codes". The least valued topic is "ethical theories".

	1	2	3	4	5
1: *Ethical theories*	9	18	**36%**	28	9
2: *Professional codes*	4	10	15	**46%**	24
3: *Analysis of cases*	4	6	16	24	**49%**
4: *Methods of analysis*	12	9	31	**31%**	15
5: *Computers in critical systems*	-	10	27	27	**28%**
6: *Legislation*	3	9	27	27	**31%**

3 Conclusions

The experience has been rewarding from both viewpoints, that of the teacher and that of the students. Teaching computer ethics helps to view software development from a professional perspective. The general feeling is that moral principles and ethical behaviour should be taught whenever a profession wants to be established. The analysis of the professionals' behaviour complements the technical education. But the underlying issue is how to fit the ethical concepts within the rest of the topics. Ethics can fill the holes of the law and, possibly, teaching together both concepts could be the best approach. However, we must emphasize the clear distinction that exists between ethics and law, even in the computing field.

The final conclusion is that teaching computer ethics is a way of improving the human factors in software development and that it is worth the effort.

Acknowledgements

This work has been carried out under project UPV-EHU 083-98.

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