Paper Title: Value formation strategies in a Technical School of a Catholic University
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Abstract:
In this paper we analyze the value formation options taken at the School of Engineering of the University of Deusto (UD), a University of the Roman Catholic Church, run by the Society of Jesus (Jesuits), in Bilbao, Spain.

We are part of a University that aims in our days to serve society, particularly the society our University is embedded in. Moreover, this contribution to the community is to be sought within a University framework and from a Christian viewpoint.

The University believes that Christian philosophy, which is at the root of our culture, as well as being an answer to the ultimate questions, can also inspire the human being and stimulate him/her to achieve a deep, reflective and critical knowledge of every genuine process of human culture and heritage.

Nevertheless, in our context, the most popular religious denomination, the Roman Catholic faith, is not something shared by all nor something that can be imposed to our students and professors. The university welcomes pupils with plurality of beliefs.

In this context, the activities related to the dialogue between science and religion are more difficult to raise than those related to the dialogue between ethics and the technology. In the nineties the University chose to include an obligatory subject of ethics. Subjects with religious content exist, but they are not compulsory.

The offer of Christian Ethics is optative. The Ethics of rational basis, opened to religious morality, is obligatory, because it concerns all the students, as humans and citizens, independent to their religious beliefs. It is a decisive part of their integral formation. In addition, it has to do with the pole of justice of the Jesuit mission.

By doing so, we aim at putting a means for a formation that goes beyond the pure technical formation and opens the student to the question of values.

Biography
Jose M. Guibert is currently vicerrector at the University of Deusto (Spain) and Delegate for Mission Development. He is professor at the Department of Management and the Department of Ethics. His research topics and teaching areas in the past years have been Management of Technology and Ethics of Technology.

He obtained a Ph. D. in Industrial Engineering (1996) at the University of the Basque Country (Bilbao, Spain) and previously a S.T.L. from JSTB (Jesuit School of Theology at Berkeley) working also with CTNS (Center for Theology and the Natural Sciences in Berkeley).

He promoted, in 1997, the Conferences on Society and Information Technology that have been held since then in different Spanish universities (Bilbao, Salamanca, Madrid, Barcelona…).

He is presently chair of GDET (Deusto Group of Ethics and Technology) which is supported by the Metanexus Institute's Local Societies Initiative.

Paper Text:

Introduction

The University of Deusto was founded 120 years ago. It is the oldest private university of Spain. Is not a big University (12000 students), nevertheless it is, in number of students, probably the largest Catholic University of Europe. The School of Engineering plays a relevant role: is the greatest of the University (2700 students).

We live in a social context that was Roman Catholic some years ago and that is losing a good part of its religious traditions quite rapidly. Some data on our students according to a 2004 study:

- 61% consider themselves Roman Catholic

- 1,8% are believers of other religions or denominations different from the Roman Catholic

- 37,2% are agnostic or atheist

The majority chooses this University because of its prestige, educational quality or proximity. Only 6% choose this University because of its religious character. 25% say the are interested in religious activities, though that interest is sometimes difficult to see in practice. People tend to practice their religion in their own parishes and more rarely at the University itself.

The University has a School of Theology and different "confessional" centers and activities. Nevertheless, the offer of Christian Ethics is optative and not compulsory. On the other hand, the Ethics of rational basis is obligatory. This option is justified pointing at the fact that Ethics concerns all the students, as humans and citizens, independent to their religious beliefs. We think it is a decisive part of their integral formation.

Jesuit tradition in the Sciences

The university is run by the Society of Jesus (Jesuits), a Roman Catholic 450 year old institution with broad tradition in intellectual apostolates. Part of this intellectual apostolate has been, and is, linked with the sciences.

In 2001 the group of "European Jesuits in Science" wrote a Mission Statement. This group of religious men, mainly priests, wrote this text as a definition of how we understand our mission in the different institutions we are working at. The text of the statement reads as follows:

> *The mission of a Jesuit in science is to serve humanity in the Church as an apostolic religious through a life dedicated to science and technology.*
>
> *Today he perpetuates the rich and varied tradition of Jesuit scientists in attempting to inculturate the Gospel message in a contemporary science-based culture. Through his research, he contributes to the expansion of the understanding of divine revelation.*
>
> *Since he is in a position to gain a deeper understanding of science from within, as well as possessing a capacity to situate this understanding in the plan of salvation, he contributes to building bridges between the unfolding scientific worldview and those approaches presented by philosophy and theology.*
>
> *Trying to use the common language of the people and being closely linked with them, he collaborates with scientific colleagues from various cultural and religious backgrounds in striving to bring about a more human world, while recognising that he lives in an unjust one.*
>
> *By critically clarifying the understanding of his own faith using science and technology, and by working with others to co-create a better world he is instrumental in raising the quality of human life. Simultaneously, he also helps create an awareness wherein the negative aspects associated with science and technology (e.g.: promoting a one sided materialistic view or technocracy that justifies inequality) are highlighted.*
>
> *He, as a servant of Christ's mission, is able to demonstrate how science reveals the marvels of God's creation in which people can truly find God in all things.*

Following the spirit shown in the lines above, in 2002-2003 we tried to foster dialogue between science and religion in the University through a new elective subject. The name of the subject was "The dialogue religion and science today".

The aim was to know the more relevant issues in the relation between theology and the sciences, looking specially at the historical problems and the more relevant opportunities of dialogue nowadays. The program of this new subject had ten themes:

1. Origins of modern science and Christian faith
2. Enlightenment and different positivisms
3. Historical overcome of logic positivism
4. The "New Roman vision" and its fruits
5. The standard cosmological model and its empirical basis
6. The Darwinian biological evolution and its problems
7. The models of God's action in the world
8. The kenosis of the Creator
9. The Logos as design
10. The Spirit restorer

The program was very attractive, that is what we thought anyway. However, very few students registered and the subject was not taught because of that few attendance. We will have to try another time or another way.

We realized that the activities to foster the dialogue between science and religion are difficult to raise in an explicit way. Those related to the dialogue between ethics and the technology seemed more "acceptable".

The Chair of Ethics

The University created in 1993 the Chair of Ethics. This Chair is responsible of promoting and coordinating the activities linked with Ethics (mainly Professional Ethics, though not exclusively).

There are 20 teachers of Ethics at the University. They belong to the different departments of the different Schools or Colleges of the University. Those teachers have a second adscription to the Chair of Ethics (their first adscription is to their own department). This Chair organizes courses and seminars for the whole group of teachers of the university (600 primarily dedicated to the university, plus 1400 only part time).

These past years the main activities of this Chair of Ethics have been linked to these objectives:

-to coordinate the different teaching subjects linked with Ethics (mainly Fundamental Ethics and Professional Ethics) in all the undergraduate degrees and, when it is possible, in graduate programs

-to help prospective and actual teachers of Ethics in his/her specific ethical formation

-to foster initiatives with society, open dialogues around the general idea of "social ethics"

-to participate in different University networks, beginning with those belonging to the Society of Jesus

-to offer orientation services to those who ask for it (e.g. professional organizations, …)

-to promote research and publications regarding the above objectives.

These objectives are executed at different levels and sometimes different activities serve to achieve more than one of those aims.

Ethics as a subject

The subject of Ethics, in different forms, is compulsory in all the undergraduate programs, normally 6 credits taught during the last two years of the program. 20 teachers are involved in those subjects: six have a background of philosophical training, and the rest have their main training in other academic disciplines, though have gone through a process of learning philosophy for their teaching of Ethics.

There are different reasons to defend *Ethics* as a compulsory subject. The University is a Jesuit University. This means different things. On the one hand, it has a mission linked with faith and justice. On the other hand, it is open to students from different believes, open to pluralism, which implies that the offers of explicit Christian Morals should be facultative, but that the rationally founded Ethics, though open to religious Morals, has to be compulsory, because it concerns all students, as persons and as citizens, be their beliefs what they be. It is a decisive part of his/her integral formation. It is open to all.

One could think that the fact of making it compulsory would provoke reactions against it, so one could argue that it could be better to let it be free. However there are good arguments to make it compulsory. The main is that we want to show the students that the ethical dimension is fundamental for every professional activity. Ethics somehow is part even of the definition of a profession. The reality, in these past years, is that there is no special opposition to this subject as a subject. Perhaps it was in the technical degrees were there was some problem at the beginning.

The reason of having the subject during the last courses is that the student is more mature as sees himself/herself closer to his/her professional life. The experience we had validates this decision: when the subject was taught in the first year it was not successful.

Teaching strategy/pedagogy

We try to link as much as possible the philosophical foundation (Fundamental Ethics) with the professional perspective (Applied Ethics). Through this, we want to link the

academic rigour as a university subject with a somehow "experienced" point of view of the person who has to find reasons for his/her moral convictions.

This has proven to sort two difficulties:

> -One problem with this option is that some students may not be motivated to study philosophy. This makes us think about adequate pedagogical strategies to teach and also appeal to the responsibility of the student as student.

> -The second problem has to do with the teachers. If the teacher is a specialist in Ethics, he/she has to open him/self to the profession he/she is dealing with. On the other hand, if he/she is a specialist on a specific subject linked to a particular profession, he/she then has to be open to Ethics as a discipline. In both cases we have tried to select and form instructors. And tried also to foster dialogue among different specialists.

On the other hand, we try to propose two ethical visions: one more deontological and, on the other hand, the more teleological view. We try to educate not only for the profession but also as citizens. Not only the deontology of a profession, but general deontology linked to social justice and human rights.

Ethics is a practical discipline. We do not aim to introduce just theoretically to moral doctrines. We assume that the students, who have already gone through different socialization processes, have already a basic and stable system of moral options. Nevertheless we assume also that there is something relevant to propose to them, so that she/he may advance in a critic discernment and in an adequate hierarchy, systematization or foundation of his/her moral schema. He/she can complement or apply it to his profession. On the other hand, which is more rare, he/she may reformulate some of his/her basic convictions.

Ethics in Engineering

Being a good engineer means something more than being technically competent. In past years engineering as an activity has been in our milieu a professional activity somehow far from the ethical discussions and dimensions. Technology is neutral, it was said.

Ethics is not a private or intimate matter of a professional. It means, on the one side, that the engineering activity takes place in a social context: first, organizations, normally enterprises. On the other side, the activity has a social dimension because its effect goes farther than the particular client or user of services.

In the case of the studies offered at the School of Engineering (seven different degrees) the objectives of the subject of Ethics are those that follow:

- to become aware of the necessity and inevitability of the ethical reflection in the profession of engineering

- to catch the irreducible specificity of Ethics as a philosophical discipline

- to know the more significant ethical approaches within the present panorama of questions related to engineering

- to reflect on the necessity of a rational grounds to respond to moral dilemmas related to engineering.

In the subject taught in different degrees of Engineering (Telecommunications, Computer Science, Electronics, Management…) we begin with a study of what the profession of engineering means in our post-industrial societies. Then we analyze our society looking for the impact of technology in three social subsystems: economy, politics, culture. After this sociological approach we analyze the relation between ethics and science. Then we concentrate on ethics in engineering: general principles, criteria, professional codes, and so on. We end our program with a number of practical cases in which we ask our students to apply what they have previously read and reflected on.

This subject of Ethics was new in the curriculum. It was not there ten years ago. We had to see who we would educate the new generation of engineers. We had to integrate this formation on Ethics in a curriculum which was already established. We still have to look for means of evaluating the success of the formation we give: do we feel (or "measure") any change in the students?

Given a regular professional situation, different questions arise: when such a situation is immoral? What ethical considerations should be made? In fact, it is unethical not to imply oneself in an ethical decision. How may one identify what is and what is not ethical? How does one reason and argue in ethical issues and dilemmas? How does one involve oneself with one ethical option, not looking for a personal benefit? Where are value judgments and ethics implicit in the process of science?

These courses on ethics have sometimes to fight against skeptical positions of students, teachers and administrators. We try ways of integrating successfully ethical education in the curricula. We try to involve different instructors to give credibility to the workshops and courses.

Students see they are not alone in their ethical dilemmas and experiences. There are many fields to be addressed. Institutional guidelines, codes of ethics are many times vague and hard to develop. Students realize about the ethical nature of previously lived situations. Through the lectures given, papers to be done, discussion in big or small groups, invited speakers, videos and films, case studies, and son on, they begin to think about ethical situations. They become more sensitive on social, economical, political or cultural questions regarding science or engineering. They experience about strategies to

deal with ethical dilemmas. Thanks to the philosophical foundations they gain a frame for ethical thinking.

New strategies

In the following years there are a number of new activities that we are thinking about and we want to launch at the University level. They want to involve all academic programs and students, so also the students of Engineering.

There is special project on "training in values associated to social justice and solidarity". One of its objectives is to develop the students' social awareness in their different academic experiences. We want to foster the acquisition of values related to social justice and solidarity in the students of the university. We propose practical and curricular activities. The practical activities include in-company training: training in organizations that look for justice in different ways. The curricular activities include free choice subjects oriented towards justice issues and new programs that will develop ethics across the curriculum, not just Ethics as a individual subject.

There is another project on "activities focused on issues on social interest". These activities foster the values of peace, promotion of justice and intercultural exchange, thus encouraging cooperation with other institutions. The objectives of these activities are to promote reflection and awareness of peace, justice and intercultural exchange by means of the organization of events and activities and to develop academic reflection on the relations between faith, culture and justice.

These projects try, on the one hand, to develop the students' autonomous and significant learning with the UD teaching framework and to reinforce the university-society relation from their most immediate reality to their international context, with a view to a transformation. Science and religion dialogue is not explicitly formulated in these new activities the university wants to promote. However, such a dialogue does fully fit in a number of these newly proposed initiatives.

Conclusion

We have described in this paper the strategy the University of Deusto follows in value formation through the academic subject of "Ethics". In the case of the students of Engineering it is not the same as proposing a subject that explicitly deals with "religion and science" issues. We did try once an optional course on "science and religion", but, as said before, it had too few students registered, so it was not possible to have that subject.

Ethics is a way of making people think in a broad way about the sense of their academic discipline, and their future profession and job. By doing so, we aim at putting means for a formation that goes beyond the pure technical formation and opens the student to the

question of the values. In this dialogue about values, the question of religion and science may appear in a more easy way.