

# The Ethical Dimension of Work in Engineering Education

Alessandro LA NEVE

Centro Universitário da FEI, S.B. do Campo, SP, Brazil, [alaneve@fei.edu.br](mailto:alaneve@fei.edu.br)

Marli PIROZELLI N.SILVA

Centro Universitário da FEI, S.B. do Campo, SP, Brazil, [pirozelli@fei.edu.br](mailto:pirozelli@fei.edu.br)

**KEYWORDS:** *ethics, ethical dimension of work, education in engineering courses*

**ABSTRACT:** *The current requirement to form ethical professionals has generated a great reflection on the real possibilities of the University to collaborate in this task. The necessity that ethical criteria be established to mark out economic relations is gaining force. The challenge however seems to be huge, because the creation of new technologies and the constant growing of markets and information can put at risk this conscience. In engineering education disciplines of ethics were introduced, but are not enough due to the misconception of work. The cultural context in which we live is predominantly marked by hedonism and subjectivity, and reality is understood only as a subjective process. Among young people the model of a professional reaching success in a short time, and retire soon, prevails. The University should discuss the sense of work in the engineer formation, so that work may acquire its full meaning and ethics be a complement to man. In a unique perspective, work and ethics constitute two dimensions of human reality, for the integral realization of man. University must offer space so that ethics and work can be affirmed in the ever day life of the Institution, stimulating all experiences that emphasize these aspects.*

## 1 INTRODUCTION

The speed of technological change and the corresponding widening of a universe of possibilities, being both fascinating and unpredictable, do risk bringing about qualitative changes, which may have a revolutionary impact on society. Such processes, with the proliferation of possibilities, have been strengthening a belief in a complete autonomy of the sphere of technology and science in regard to the field of ethics. According to this view, criteria would rather be defined by their practical applications than by any other intrinsic legitimacy. Technological development would thus become a mere question of practical usefulness, while acquiring a nature at the best parallel and ultimately a separate one from man, its very creator and beneficiary. [1]

This has had a strong impact on society in general, but in a special way on professionals, and has led to a questioning on ethics. The current requirement to form ethical professionals has generated a great reflection on the real possibilities of the University to collaborate in this task.

It is certainly not difficult to notice that the main challenge at this early century is to be found in the field of ethics. In the myriad of problems of everyday life, one notices an absence of any criteria for acting, how hard it is to assert any value of judgments, an attitude of hesitation or indifference resulting in paralysis and easily leading to a sterile indignation. Topics once reserved to philosophical debate are becoming more and more current conversation matter, increasingly pervading the common man's daily universe, thus suggesting the urgency of a redefinition of the very tissue of social relations. It is commonplace, nowadays, an outcry for ethical values in all spheres of social life clearly dominated by unfairness and impunity.

The necessity that ethical criteria be established to mark out, for instance, economic relations, the repudiation to actions that deteriorate the environment or violate human rights start to gain force more than ever. Economy is certainly a good example, for it is clear that there is a need for ethical criteria in commercial dealings and financial transactions, not to mention the growing repulse to whatever might look as an aggression to the environment or a menace to human rights. Here, the challenge is all the greater, since the notion of a world market and work related to new ways of production seem to be making increasing demands on enterprises, expectations of always higher levels of production and competitiveness stressing considerably the limits of plain ethical principles.

The challenge however seems to be huge, because several factors, like the creation of new technologies, the constant growing of markets and information, the new production systems and work relationship, have demanded from companies more productivity and competitiveness, which can put at risk these principles and man's conscience.

The practical gains technological research adds to the various fields of human activity, such as information, education, medicine and production of goods, among others, do unquestionably add great benefits to man; not forgetting that in all this the implicit prospects of dominion of reality understandably add greatly to the euphoria. However, vertiginous technological advance does all the more demand of man the corresponding objective critique enabling him to be the effectual guide to a process supposed to add to the common good, and lead his own full realization as well as that of his fellow men [2].

The technological revolution that is going on, mainly based on all kind of informatization processes, is certainly responsible for shortening distances and reducing times dramatically, with concrete effects on production, competitiveness and finally on profits [3]. Paradoxically, the same technological revolution has, on the other hand, an opposite effect on people who, in spite of being "virtually" closer to one another through communication on Internet for instance, are becoming more and more isolated. This certainly contributes to narrow the focus of their interest on a reduced range and personal view of life, of the world, and mankind.

## **2 THE HUMAN DIMENSION OF WORK**

In engineering education the reply to this has been the creation of disciplines of ethics, which, by themselves, are not enough due to the misconception that students, and society in general, have of work. The cultural context in which we live has been predominantly marked by hedonism and subjectivity, which refuse the values of the object in it.

The reality is understood only as a subjective process, being reduced to the set of emotions lived by the citizen. In this way any aspect of life must produce immediate and positive results, otherwise the object must readily be abandoned or substituted by another one. The exercise of a profession is inserted in this context and the work quickly becomes a stage to be overcome, an instrument capable to guarantee the access to a privileged position in society. The model of a successful professional that prevails among the new generations summarizes this ideal of man: a young professional, whose fast ascension in the career provides for high profits and prestige, projecting his professional performance in a short period of time, so that he may retire as soon as possible. In this direction, the practice of illicit acts can easily be accepted and justified in certain circumstances.

The stimulus to work seems to be supported, even at the University, on a fragile conception of man, because its unable to consider all aspects of human reality. Engineering courses seem to be easy prey to such reductionist views, the student being discouraged to consider the totality of factors composing the unity of reality; the techno-scientific approach usually aims at a partial and fragmentary view of reality, concerned as they are with an exclusively technical education, wholly contained in the limits of instrumental reasoning. Ethical education becomes a very hard task once we view it against a cultural background soaked with individualism, relativism and glare of quick professional ascension [4].

It would be pitiful to forget that at the very root of "technique" there is and has always been "man", a being endowed with wits and freedom. "At the end of the day, techno-scientific inventions are but irresistible expressions, albeit reductive ones, of man's search for freedom, his urge to be free from time and space, to communicate regardless of physical distance, to develop in spite of scarcity of natural means. It is but freedom which explains man's attraction for technique, beyond and behind which we are bound once more to see but man and the enigma of his freedom"[5].

The University should discuss the sense of work in the engineer formation, so that work may acquire its full meaning, and not only be a means of making money or survival, and ethics be a complement to man, becoming thus the inevitable consequence of the conscience in itself. Whenever human action be concerned solely with achieving sectorial aims, such as professional excellence regardless of ethics, man is bound to be the loser; for what is ever at play in human effort is nothing less than fulfillment of all human dimensions, not least a state of social relations based upon perennial values such as truth and justice. What lies at the very root of all human effort is more than satisfactory fulfillment of important, but partial aspects of life, such as professional, health or family affairs; what roots human effort in sound

ground is rather man's plain realization of his being-as-man; only then he does truly make reality more becoming, more pliable to his own full development.

A work that has solely the aim of limitless and unsustainable increase in production and consumption is contrary to the person human being and its deeper aspirations. The most important needs of our society, mainly in this age of the globalization, are not depleted in the consumist model of a spasmodic production of new material properties, but embrace services to the person, the family, the interpersonal traditions, and solidarity between generations. To put the work back in this global context of the person human being means to reconstitute sense and value to the work, as well to open the way for a truly new civilization [6].

Work is not only a way to live with dignity, but a cultural activity, the space where it can be expressed the personality, the creativity, the free initiative and the knowledge of each one. It is an instrument of participation in the life of the community. We live today the paradox of an economic and social system that does not know how to value the potentialities and the necessities of the people. Material resources are certainly necessary to provide content for relationships among people, but it is necessary to invert the view that has prevailed until now: it is not the relations among people that must submit themselves to the logic of the material goods, but it is material goods that must be subordinated to the needs of people and relationships among people [7].

In a unique perspective work and ethics constitute two dimensions of human reality, for the integral realization of man. From the recognition of the human person as an absolute value, a source of a dignity whose rights are worthy standing for, the student is presented with the principles of solidarity and subsidization; his perception of reality should thus begin to widen, allowing him an easier handling of criteria of judgment and valuation focused on the Common Good. Once mastered, such criteria begin to be applied in the analysis of questions ranging from the preservation of the environment (i.e. refusal recycling, use of natural resources, etc) to the very notion of sustainable development. All this should by then become part and parcel of his manner of perception as how his profession ought to be assumed.

Bearing in mind each student's natural maturing, his increasing understanding of his responsibilities, his chosen course and his future profession, it appears the need for the acquisition of more than basic knowledge of present day law, all the more that this is designed to coincide with his impending insertion in the work market. According to the affirmation of clear criteria for action, it becomes possible to approach a diversity of questions viewed under the light of ethics: market, globalization, war, and poverty, all of it to be considered with a marked accent on individual responsibility.

The very fact of bringing into the classroom subjects "alien" to professional training, such as euthanasia, the use of embryos in scientific research, the legitimacy of war, urban violence, and the like, this very widening of teaching is bound to bring to surface a reflection on human nature, on the elementary evidences and demands inherent to it, such as desire after truth, justice, beauty, all of which will gradually provide ever more solid criteria for dealing with the multifarious challenges of personal and social life.

To educate with and for ethics means to establish at every turn a nexus between each action and the ultimate aim of human action. That is why education for ethics has realism as a premise: never to proceed from any ideal concept whether of man or of society, but always from the standpoint of an acute and passionate observation of that which actually constitutes reality there and then. The examination of themes of actuality, mainly those related to work, brings into the class room everyone's personal experience, a reflection over one's difficulties and successes, an "education of reason" which is but man's very nature, his natural bias in recognizing truth and ordaining his actions accordingly, aiming at the Supreme Good [8].

Questions pertaining to the flexibilization of work rules, the diffusion of the concept on social responsibility amidst the firms and enterprises, the practice of corporative citizenship, all of these are already in the floor of our class rooms, since the best part of our students are already part of the work market, either as full employed or in waiting for employment. In the latter years, many have been working while still following courses, those in the evening classes being mostly "workers" returned to the University in search for a deeper and more actualized knowledge in some area with which they have already some contact.

"Living ethics" in the very space of the institution, for the student means respect for others, attention to their needs, practice of fairness in judgments, detailed care for the immediate environment, a kind ear to the complains of both professors and ancillary personnel, all of which gives support and legitimacy to the formal teaching of ethics.

Our major challenge, consequently, resides in the task of forming professionals able to survive in an ever-changing world, teeming with uncertainties coming from new forms of production and work. It lies, mostly, in the call to form men and women capable of recognizing in all circumstances the possibility of full realization of their human nature, parallel as it is to that of all others. University must offer space so that ethics and work can be affirmed in the every day life of the Institution, stimulating all experiences that emphasize these aspects [9].

### 3 CONCLUSIONS

To educate with and for ethics means to establish at every turn a nexus between each action and the ultimate aim of human action. That is why education for ethics has realism as a premise: never to proceed from any ideal concept whether of man or of society, but always from the standpoint of an acute and passionate observation of that which actually constitutes reality there and then. The examination of themes of actuality, chiefly those related to work, brings into the class room everyone's personal experience, a reflection over one's difficulties and successes, an "education of reason" which is but man's very nature, his natural bias in recognizing truth and ordaining his actions accordingly, aiming at the Supreme Good.

Questions pertaining to the flexibilization of work rules, the diffusion of the concept on social responsibility amidst the firms and enterprises, the practice of corporative citizenship are also important topics to be debated.

The valorization of work should be manifested at the university in class, or other formal academic and cultural activities, social actions, projects, seminars, competitions, teamwork, and other activities, where the satisfaction for the "making", the sense of duty and responsibility, and the concern for the community are more important than the result itself.

### REFERENCES

- [1] SEVCENKO,N, *A Corrida para o Século XXI*, S.Paulo, Companhia das Letras, 2001,pp 38.
- [2] LA NEVE, A & SILVA, M. Pirozelli N. *The formation of Ethical Criteria for the sociable responsible engineer*. Proceedings of ICEE'03, Valencia,Spain, 2003.
- [3] LA NEVE,A, AGAZZI, C.,*O Papel da Infomática na Redução da Distância entre Ricos e Pobres.*, Cadernos da FEI, no7 , Centro Universitário da FEI, S.B.Campo.Brasil, February 2004 ,pp 29-30.
- [4] GIUSSANI, L., *Educar é um risco*, Companhia Ilimitada, S.Paulo.Brasil, 2000, p.45.
- [5] LA NEVE , a, AGAZZI, C. "*Refleteindo à luz do Ensino Social Cristãos*" , Seminário do Núcleo de Estudos da América Latina (NEAL), Universidade Católica de Montevidéu, julho de 2000, p.21.
- [6] LA NEVE,A. , AGAZZI, C. "*O papel da Infomática na redução das distâncias entre ricos e pobres*", Seminário do Núcleo de Estudos da América Latina (NEAL), Universidade Católica de Montevidéu, julho de 2000, p.22.
- [7] LA NEVE, A, AGAZZI,, C. *Refleteindo à luz do Ensino Social Cristão*, Seminário do Núcleo de Estudos da América Latina (NEAL), Universidade Católica de Montevidéu, julho de 2000, p.21-23.
- [8] SILVA, Marli Pirozelli N., *Moral e Educação Moral no Catecismo da Igreja Católica – subsídios para uma Filosofia da educação*,Mandruvá- FFLCH-USP, 1999, p77.
- [9] PIPER, Josef, *Abertura para o todo: A chance da Universidade*, Apel,, 1989, p.32.