EUCEET III

THEME H
Synergy between Academic & Professional Worlds

STATE OF THE ART, TURKEY 2008

INTRODUCTION

This report reflects the personal opinion of the author who has been teaching in one of the leading universities of the country for the last almost forty years. During these years, he has continuously been familiar with various problems of the construction industry through the consulting work he performed. Since he has always taken part in various activities of the Chamber of Civil Engineers, he also had the chance to observe the changes in the civil engineering community and in the civil engineering profession.

STATE OF THE CIVIL ENGINEERING EDUCATION

Despite the significant physical and technological improvements introduced, the level of the civil engineering education does not appear to be as high as it used to be a few decades ago. One can easily list some of the major factors causing this change:

- Civil engineering is not as popular as it used to be, most probably due to the less attractive employment conditions. The modest salary for the hard work does not appeal to the younger generation vis-à-vis the attractive income promised by the finance sector. Consequently, the best students do not prefer studying civil engineering.

- A high school graduate is admitted, on the basis of his/her entrance examination score, to a university programme among the 18-20 programmes he/she has indicated in order of preference. Very few students are placed in programmes of their first choice. In other words, majority of the civil engineering students are studying civil engineering, although it is not their favourite subject.

- Numerous universities have been established in the last three decades without preparing the required faculty infrastructure. So, there still are some civil engineering departments striving to train civil engineers without a sufficient number of competent faculty.

- Recent developments in the software industry are misinterpreted by engineers and engineering students. They have the illusion that the blind use of the software available in the market makes them engineers. This is another important factor that makes the students loose their already insufficient motivation and interest.

However, the author is not pessimistic about the above explained level of education. His teaching experience abroad (USA, Canada, New Zealand, UK) gives him the impression that these problems are rather universal.

STATE OF THE CONSTRUCTION INDUSTRY

The construction sector occupies an important place in the Turkish economy. It may presently be somewhat slow due to the global and local economic fluctuations. However, it will no doubt come back and resume its leading part soon. In other words, civil engineering is still a much needed profession due to its great work potential and will remain that way during the next few decades. The industrial and social infrastructure of the country has not been completely constructed yet. Besides, the existing infrastructure is aging and thus is in need of rehabilitation and possible expansion. Another considerable work potential lies in the seismic retrofitting of the existing building stock or its replacement.

As far as the level of civil engineering practice is concerned, construction industry displays a peculiarity and takes place in the two extremes. On the one hand, top quality design and construction services are provided by the leading companies successfully competing all over the world. On the other hand however, a substandard even deficient civil engineering practice is quite widespread. The typical example of the work of the latter category is the huge seismically vulnerable mid-rise building stock resulting from improper design, substandard construction, deficient materials, improper workmanship etc.

The unsatisfactory civil engineering practice mentioned above cannot be directly attributed to the problems of civil engineering education. The contribution of the insufficient and possibly incompetent construction supervision system cannot be ignored. The present construction supervision system seems to require a substantial revision.

NEED FOR NEW CIVIL ENGINEERS

The present number of civil engineers registered with the Chamber of Civil Engineers is around 70 000, and more than 3 000 new graduates are being added each year. In view of the expectations of the “Five-Year Development Plan” of the State Planning Agency, this is a rather satisfactory picture. However, the author tends to attribute more importance to quality than quantity, thus he is primarily interested in increasing the number of qualified and capable civil engineers. He considers the present number of undereducated, barely standard civil engineers adequate, if not excessive.

The author is convinced that the establishment of a professional engineering system may significantly contribute to the betterment of the civil engineering practice, through social encouragement for the engineers to improve their educational and professional performance level. A good deal of progress has been made in the last three years towards the development of a professional engineering system within the Chamber of Civil Engineers. The system is expected to become operational in Spring 2009.

Continuing education is another important component that may help the improvement of the civil engineering practice. Construction industry does not seem to pay the due attention to continuing education. Few companies care to encourage their employees to take continuing education courses, and even fewer organise such courses themselves. However, to enforce continuing education, the Chamber of Civil Engineers requires a certain number of continuing education credits for renewal of licence. To this end, they organise hundreds of continuing education courses all over the country every year, and issue credits to the attendants. They are presently in the process of improving the contents and standards of these courses.

UNIVERSITY-INDUSTRY INTERACTION

Educational Matters

Construction industry contributes to the educational activities of the universities only through indirect channels. Some of these contributions are explained below on the basis of the example of Department of Civil Engineering, Middle East Technical University.

- **Accreditation Related Questionnaires** – This department has been accredited by ABET twice in the past and currently is preparing for the third. Input of the construction industry is essential in the revision of the course contents to consider the needs and wishes of the industry in shaping the engineer of the future. Furthermore, it is essential to get the feedback from the employers about the performance of the earlier graduates.

- **Capstone Design** – Experienced practicing engineers actively participate in the instruction and supervision in this must course. Furthermore, design problems assigned every year are usually chosen from the actual practice to familiarise the students with the facts of life.

- **Hydro-Power Engineering Centre** – High level experts from the industry take part in the development and instruction of the related courses, besides participating in planning and execution of research in this particular field.

- **Technical Electives Given by Practicing Engineers** – Several technical elective courses are given by part-time instructors who are experienced practicing engineers.

- **Summer Practice** – This is an old fashioned but rather effective activity leading to direct involvement of the students in the actual engineering practice.

- **Extracurricular Student Activities** – Students often organise various activities bringing students and potential employers together, such as lectures, dialogues, career days, student competitions etc. Some of these may be comprehensive enough to accommodate one or two small workshops involving academia and high level managers from industry.

Collaboration in Research and Technology Development

Universities and leading companies collaborate in performing research and technology development to a certain extent. This research is predominantly experimental, and it generally concerns a specific problem brought by the industry. Universities provide the know-how, research manpower and research facilities and the companies provide finances.

This kind of collaboration has recently increased significantly both in extent and in content after the participation of the country in the Framework Programmes (FP6 & FP7) of the European Union, since most of the programmes require an extensive collaboration of the academia and the industry, including SME’s as well as large companies.

Most of the leading universities have established their technoparks in the last 5-6 years, and the advantages a tecnopark presents encouraged the faculty and the companies to further their collaboration in research and technology development.

Consulting

Construction companies knock at the door of the university whenever they need the expertise of the faculty to rescue them from the problem they are facing, usually a problem caused by their deficient engineering practice. It is usually so urgent that the report they require is already overdue. However, putting the joke aside, this is a very important and effective channel of university-industry interaction. It is extremely beneficial for both sides. Industry usually finds an effective and economical solution to its problem, whereas the faculty is kept in contact with the engineering practice so that they are not isolated in the ivory tower. Furthermore, nobody can complain about a small extra income, especially if the professor is getting "celery" instead of a decent "salary" as in the case of Turkey.

EPILOGUE

The above text is a very simplistic effort to present a brief account of the university-industry relationship in Turkey as observed from the eyes of the author. The author is quite aware that a scientific and meaningful report on this subject requires a comprehensive study of numerous research papers in related areas, a careful evaluation of statistics, an expertly discussion of the related phenomena etc. However, within the framework of the time available and the limitations of his capability, and considering the level of this particular committee work, this humble contribution seems to be all he can offer.

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