

Review

Contribution of social science electives to engineering students

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ABSTRACT

Even though at first sight engineers are concerned solely with technology, they are superiors of a number of employees, whom they should handle wisely. Moreover, interactions with other units within the technical environment necessitate further human relations, as well. In that context, some familiarity with social sciences appear to be extremely useful for achievement in the field of engineering. Accordingly, social science electives should be encouraged in engineering faculties.

Keywords: Engineer; technical environment; social sciences; behavioral sciences; human relations.

INTRODUCTION

An engineer is not merely a man equipped with knowledge of natural sciences and technology and know-how and merely anxious to keep up a smooth production and maintenance or come up with innovations.

He / she needs at least some superficial (if not substantial) knowledge of social sciences and especially knowledge pertaining to human behavior, for the sake of the job.

A Kind of Necessity as well as a “Flavor”

Of course an engineer mainly copes with technological problems. But, he / she is the superior of a working “crew” and in this respect he also deals with people. In fact; in the field of engineering, the higher one gets promoted, the thicker gets one’s administrative concerns over the subordinates and the thinner gets one’s technical concerns. In other words, behavioral sciences and managerial skills come more into the play.

About a decade ago; in a newspaper-interview with one of the two partner-bosses of a huge construction firm; the “old man” emphasized the unfortunate monotonous aspect of his profession and asked the interviewer if he remembers an engineer as a film hero? He went on to say that they experience little if any excitement in their jobs.

In our senior chemical engineering year we had a trip to a caustic soda plant in *Derince* (not far from the Asian side of Istanbul). On the return trip a student said: “Maybe one or two of us will end up in that plant after graduation”. The girl next to me mechanically exclaimed: “God forbid!” (Later she would trade the monotony of a factory environment for the lesser monotony of a laboratory; in order to make a career in clinical biochemistry at *Çukurova* Faculty of Medicine —where I would be her adjacent neighbor at the Chair of Legal Medicine for a year— and she eventually obtain full professorship and then transfer to *Cerrahpaşa* Faculty of Medicine in Istanbul).

“Noise, smell, heat, unrelenting pressure of endless

repetitions of their jobs! The assistant plant manager walks through the workers and gets aware of sour looks and senses a mood of unrest. It happens sometimes without reason, at others times with a minor cause. Sociologists, he knew, called this a reaction to unnatural monotony" (Hailey 1974: 29). *Outsiders touring the auto plants often assume workers become reconciled, in time, to those work circumstances.*

But in reality, usually, when first hired, they look on the job as temporary until something better comes along (paraphrased from Hailey 1974: 29).

The remedy to escape from the tediousness and boredom of industrial places is probably living vicarious adventures through movies, novels as well as diversification of topics with the contribution of social Years ago in a job interview, a female chemical engineering colleague —us the applicants got socialized with one another in a waiting room before the interviews began— applying for the same vacancy said that she liked to get a psychology book and read it through as if it were a novel! She said it was her hobby and main enjoyment to do this. s.ç. sciences.

A former role-model

While I was working for the state-owned artificial fertilizer plant in Aegean-Turkey (in *Kütahya*) as an engineer, it was a long rehabilitation time for the factory. (The corrosive acidic by-products of the plant used to necessitate extensive repair and overhauling of some equipment in decade-long intervals). A neutralized American (of British origin) senior engineer had been employed as a temporary advisor for the plant.

His role was that of a moderator between the Turkish company and the German rehabilitating team. (Now late) Mr. Ronald David Hentsch —ironically his last name sounded as German as the members of the rehabilitating team, as he used to confess himself— had been a member of the Royal Air Force *He was one of the lucky ones to outlive the war. Many of his colleagues did not survive. Mr. Hentsch himself had undergone a lung damage due to a bullet, a blood coagulation which fortunately somehow stayed intact. I once had to explain to the company doctor that it was not a tuberculosis consumption since it could be mistakenly taken for it on a radiological X-ray film in those days. (Nevertheless, he would go on smoking his special cigarettes). Mr. Hentsch, as a war hero, is presently buried at the National Cemetery in Nashville, Tennessee.* s.ç during the Second World War. He was a terrific reader of social science books as well as novels. Before taking this job he had familiarized himself with Turkish History, as well.

In an official meeting sometimes he would grudgingly object to the uncompromising terms of the German team; and by pulling his right fist on his heart with a

content grin on his handsome face as well as a twinkle of a mischievous pleasure (*Schadenfreude*) in his eyes; he would utter his *cliché*-sentence: "*The noble Republic of Turkey will not take this from you guys and that's it!*"

He would do this in a good-humored manner and usually settle the dispute as a respected, well-spoken figure in the eyes of by both parties. His knowledge of history and other social sciences (known to people around as emerging with comments and talks through his contacts at the guest house of the company) would always back up his technical arguments and add to his prestige and successful trust-and-rapport-establishment *In his senior class course of Chemical Process Industries, while relating one of his memories in an international conference, our late professor Turgut Noyan once said that a knowledgeable and social personality was important even for an engineer. "I had encountered strange types of people in international congresses that I participated in. During the cocktail hours they would not even know how to indulge in a friendly talk! They could have synthesized the best indigo or whatever in the laboratory circumstances, however," he explained.* s.ç. His humor and wit would reinforce his well-informed views all the time. 'Once in a letter to his own boss stationed in America, he wrote that the food served at the company guest house was not really striking to a 2more or less sophisticated palate".).

Social elective courses during my undergraduate years

In my time at the Bosphorus University, engineering students had to choose a few non-technical elective courses before graduation came. Now, years after, I appreciate this practice even more. Some students could even overload extra elective social sciences if they wanted to. I took humanities myself but I really regret that I missed the Ottoman Scripture course given by Dr. Ali Alparslan and the Folk Literature Course given by late Tahir Alangu.

In his chronicle titled "*Haşşöyle*" in *Sabah Newspaper* journalist Engin Ardiç refers to the latter scholar. (A part-time instructor at Bosphorus University, Alangu was also one of the regular Turkish Literature teachers at the famous Galatasaray Lycée). Ardiç says one day Tahir Alangu came to the Turkish Literature class with a German textbook about theater and announced the students that such an elective course had been instigated in secondary schools in that country. Ardiç (January 28, 2012) says: "How we admired the elective courses of the foreigners! Moreover we could not even imagine such a privilege for ourselves!".

The journalist, in the same chronicle, goes on to make a reference to the above-mentioned Ottoman Scripture

course, as well, which he took while studying business administration at Bosphorus University —actually I remember him from another elective law course given by professor Vakur Versan— and says: “I really loved that course and before the first term was over I could read lightly-written Ottoman books like the works of Ömer Seyfettin and Hâlide Edip.(Nowadays I forgot most of my Ottoman and am having difficulty with Ottoman scripture)”.

Some relevant memories

I once attended a conference given by a visiting Brazilian engineering scholar at Bosphorus University about the hobby *Indeed, there is a saying which is especially true and illuminating for engineers, in my opinion: “He who has no hobby does possess instead a horrible phobia” (The Turkish version is more effective phonetically because the two key words hobby and phobia are rhyming beautifully in this language: Hobi and fobi !* *S.C.* needs of engineers. At one moment along the course of his presentation; while trying to stress the significance of arts and humanities as a relief for the bored-and-tired engineer; the professor held the edge of the lectern and assumed a deliberate confused expression on his face, for a few seconds.

(His English being somewhat poor, he was relying on body language and mimics a lot). Then he said: “Matter, matter all the time!” in a defying voice. “Dealing with matter extensively makes one stupid,” he tried to explain. As an undergraduate fed up with natural science courses at the time, I got really impressed and the scene got embedded in my memory.

Again while an undergraduate chemical engineering student, on a trip to a cable factory in *İstinye*-Istanbul, an overweight chief engineer who wished us a welcome proved to be a man of a philosophical mind, to my pleased astonishment. He talked about *savoir vivre* (good manners), relating a memory in London: One of his *hickish* engineering colleagues asked for *Turkish Schnaps (raki)* and caused him some embarrassment. He was not even aware that this particular local alcoholic drink pertained to Turkish culture alone and was not even available in England. (It is comparable to Mexican *tequila*, as some claim so).

On another visit to an electric-bulb plant in *Levent*-Istanbul, a young mechanical engineer in charge confessed his remorse for not having studied music instead of engineering.

Such encounters made me aware of the significance of social elective courses, even then, at the time.

While working for a newly installed and (accordingly problematic and yet-malfunctioning) pulp and paper plant again in Aegean-Turkey (in *Afyon*) as a chemical engineer; we once had a technical problem at the wet-

end section to be settled by an expatriate Italian team of two experts. The atmosphere got tight at a certain point and I, recalling some European history, made some complimenting remarks about their national hero Guiseppe Garibaldi (1807-1882), the architect of Italian unity and a war lord. I also took the opportunity to point out to the physical resemblance between one team member and the famous actor Tony Curtis. The tense ambiance relaxed. The two experts turned out overanxious in cooperating with us.

Indeed; in social settings (where business transactions can also be started), for engineers, social ways and social science knowledge account a lot. They constitute good support not even comparable with silly commonplace jokes, when it come to impress one's interlocutors.

For instance; as I usually tell my students; there might be a talk of Mr. so-and-so's being a very heavy smoker. Then you may throw in a statement like: “If our big brother Sigmund Freud had been here, he would have asserted that this individual had had a fixation during the *oral stage* of his early childhood development”. Or, there might be a mention of Ms. so-and-so's being too fastidious about matters of tidiness and cleanliness. Now, in that particular case, you may interrupt others with a statement like: “If our big brother Sigmund Freud had been here, he would have claimed that this individual had had a fixation during the *anal stage* of her early childhood development”.

The sound grounds for employing social sciences in a technical environment

An engineer is also in charge of managing human relations, especially among his / her own subordinates. Here at this point some fundamentals of behavioral sciences come handy in routine tasks and extra useful in case of crisis situations or under pressure of all sorts.

Using his knowledge, he / she can boost the morale of his “crew”. With his / her psychology formation, he / she may easily assuage or calm down an angry employee who perceives an unjust treatment (Indeed, one of the prominent motivation theories is that of equity “*When the ratio of a person's total outcomes to total inputs equals the perceived ratio of other people's [employee's] total outcomes to total inputs, then there is equity. When there is an unequal comparison of ratios, the person experiences a sense of inequity*” (Mullins 1993: 472). proposed by Stacy Adams).

Besides coping with crisis involving situations; leading personalities familiar with behavioral sciences may prevent the formation of problematic climaxes, to begin with.

The following regretful case history in an educational environment can be extrapolated onto any similar

settings without losing anything from the conveyed morals regarding puberty problems: In mid 2000s in a boarding vocational all-male secondary school in Istanbul; a certain student began sending “pally” e-mail messages to a young female teacher and this upset the teacher a lot. While correcting some homework papers, she came to pinpoint the guilty student via a key word widely employed in the anonymous messages.

She then reported the student to the principal. (The principal had recently been promoted to his post from among teachers of natural sciences). He ordered immediate disciplinary action.

The boy’s father was a policeman in another city. The perceived familial pressure for him was even more crushing than the school officials’ authority. There being seemingly no outlet, the adolescent committed suicide. For a certain time everybody in the school was in low spirits.

Now; if the principal had been a former psychology, sociology or even history or Turkish literature teacher; he could have handled the complaint like a piece of cake. (For that matter; the same hypothetical sentence applies to the female teacher, as well).

After all; for an adolescent, having a “crush” on a teacher of the opposite sex is not an uncommon happening. But, it is usually the faculty of the social branches who know, understand and evaluate such a situation wisely and tactfully.

Sometimes, knowing the mere name [In philosophical approaches; on one hand; for instance nominalism states that abstract concepts exist only as names. *But on the other hand; some esoterically mystical or kabbalistic sufi doctrines like Hurufism attribute more importance and power to letters and words than to material things. In Turkish one proverb implicitly discourages the employment of words related to bad predictions since speech can be embodied into concrete reality (söz vücut bulur). Another Turkish phrase refers to the mention of certain things being worse than their occurrence (şuyuu vukuundan beter).*

Interestingly; in a novel; the hero, librarian Neil, who has just gotten friendly with Brenda, a myopic college girl in her summer vacation (good at swimming and tennis), relates his impressions in the following words: “We sang hesitant, clever, nervous, gentle dithyrambs [hymns] about how we were beginning to feel towards one another: Actually we did not have the feelings we said we had until we spoke them —at least I didn’t; to phrase them was to invent them and own them” (Roth 1959, 1969:13).] of a psychological situation helps us to cope with it better! At least once the situation is possible to name, then it is possible to trace it, to refer to it in asking counseling or researching about it. Social sciences and especially behavioral sciences teach one the names of phenomena which could really disturb people, who are “ignorant “of such concepts and names. Like the case of

déjà vu, for instance. (It is a normal phenomenon, which could occur to anyone and the name given to it is the French expression meaning “already seen”).

While an undergraduate student I had the luck of going to Basel in Switzerland for a summer-training at a pharmaceutical plant. After my return from that highly developed country; I had a dinner at a modest suburban restaurant in Istanbul soon after I got off the airplane.

The waiter-boy had plastic slippers on his feet. A tray with the meal of dry beans that I had ordered was in his right hand. On the way to my table, he put the tray aside on an empty table; he crouched and scratched his toe for a few seconds. Then he stood up; squeezed a few slices of bread in a large jar; decided on a particular one and put it on the tray near the soup and yoghurt bowls. The all that food landed on my table!

Back in Switzerland food used to be so hygienic and now here I was, witnessing all that! A feeling of nausea came over me, which I could subdue with much difficulty without vomiting. If at the time I only had known the term *reverse-culture shock*, I would have got it over much more smoothly, I am quite sure. (An auto-suggestion technique would have relieved the feeling of disgust, making me remember and re-accept the ways and means of my good old developing country).

Technical people may invariably tend to regard people as quasi-robotic beings and underestimate [At the pulp and paper plant mentioned-above, an arrogant subcontractor in charge of insulation of the main operation building used to consider his own laborers like dirt underneath his shoes. He once said that they were “shit-producing machines”. What a horrible approach on the part of a boss to his subordinates! *s.ç.*] their feelings. However, as discovered in the Hawthorne branch of Western Electric Company in late 1920s and early 1930s by Elton Mayo and his colleagues, people’s feelings are too important to neglect in industry with a view to production. Their emotional states are astonishingly strong. Nowadays the Hawthorne Effect refers to any effects in any experiment whereby *the subjects know they are being studied*.

[In Hawthorne series of experiments] “to study how various working conditions impacted productivity, the researchers made a number of changes around the plant, such as lighting, work schedules, and break periods. They found that any change increased productivity, even those changes that they thought were not helpful to workers (e.g., decreasing the lighting). Productivity also stayed higher even when they changed the conditions back to what they had been originally. The increases in productivity were actually due to the workers knowing that they were participating in a research study. They were working harder because of the attention they were receiving and the interest generated by the research, not because the physical changes necessarily improved their ability to do their

jobs". (Stolley 2005: 211).

Engineering students who are offered elective social courses should consider themselves lucky. But adult engineers unaware of such disciplines should also be offered the related advantages through on-the-job-learning training programs.

Moreover, training is not only confined to lower levels. Supervisors, themselves, need their own proper sophisticated training to diminish appraisal errors, to eliminate discrimination and old inhibitions (like a "glass ceiling" for women and minorities). Trained supervisors handle problematic (alcoholic, neurotic, sickly, those stealing materials or money etc.) employees better. Many rumors in work places are replaced by their truth versions thanks to learning. For example, fictions circulate around women employees, specifying that they work for additional income or luxury or they like repetitive, routine tasks or do not aim promotion. All are wrong. They are self-supporters or family-supporters; they only tolerate repetitive tasks better and they like promotion as much as men do (Çaya 2012, as filtrated and paraphrased from various management books).

CONCLUSION

Engineers should be equipped with some knowledge of social sciences, especially behavioral sciences to insure smooth working circumstances within the technical framework. After all; whatever the present machinery may be, it is human beings with feelings who operate them and interact with other human beings to accomplish material success.

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