

## The engineer in the university

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(an engineer)

What is the university trying to do, produce robots, something like an assembly line product? It certainly appears to me that way. Although he is a specialist in a certain field of engineering, there seems to be a part of his being which is missing.

What is the purpose of a university education? The right answer to this question is, in most cases, in order that one may increase one's ability to think and also his capacity to think. There are other reasons of course, but this is the most widely accepted. It is a period of growing up and a period of socialization.

The engineering course offered at most schools usually makes the engineer feel that this is his 'bag' and that is all there is to it. I really think that he is overlooking something. I will attempt to enlighten you regarding this statement in the following epistle.

The engineering course is lacking in scope. What I am getting at is that he is not well-rounded in his education and views as he might be. The employer wants a reliable graduate who can 'think on his feet.' Chances are you, as a graduate, will be put through the ropes of the firm to see how you will react to various environmental phases of the company, in fact, to see what type of work you are best suited for and also to see what type of person you become when confronted with your peer group. Most of the larger companies have a training program and they usually assume you know next to nothing about business life and the working world. The world in reality is suddenly before the graduate engineer! The minute he steps into it, he starts from the bottom again (and hopefully will work up) knowing very little about anything and realizing this more and more as years go by.

The engineer is a specialist for the most part but this fact does not exclude him from getting along with the rest of society the best way possible. How can an engineer adapt to varied environments if he is taught to focus his ideas, his views, and his thoughts on the monotonous mechanical application of cold formulas and steadfast theorems which are always available in text or chart? His mind must be made to wander into the fields of his social environment and to be aware of the problems that exist through variations in behaviour patterns. Surely without greater insight into reality, we will be preventing ourselves from functioning to our fullest.

Communication, or as Dr. McKay would say 'dialogue,' is of paramount importance at any time especially during post academic employment. To develop this art of communication it is

usually necessary to be exposed to it at a fairly early age. In most instances this is not the case. Engineers, it seems to me, are more cliquy in their attitudes and actions than other disciplines. Their scope is narrower and they do not express themselves as properly or as adequately as they should when called upon to do so.

Another point which I have felt worth mentioning is classroom technique (mainly concerning engineering subjects). More dialogue between student and teachers must be encouraged. Better methods of two-way dialogue must be incorporated into our waning system of teaching. Perhaps it would be a good idea to have a more seminar-oriented curriculum (at least in the final two years before graduation). A research period followed by a question-and-answer period on some chosen or appointed topic would certainly enhance the participants' communicative aptitude. A student's initiative and creativity must be brought into the open. As seen in some of Elton Mayo's experiments in the Western Electric plant concerning employees and production, attitude had a great impetus on the rate of output from the employee. This attitude can be brought out in the classroom through a little effort. Classroom tedium should be lessened if not eradicated by variations in atmosphere, that is, talking and/or learning in different areas of the building or school. In short, the student should be given more time to his self for creative thought and research, on a minor scale of course.

For example, students should be given a chance to be able to lecture to a class (not necessarily in the engineering faculty). The benefits would be mainly two fold: one, the student in question would be improving his public speaking ability and two, the student would have to prepare a reasonably creative talk on something which he may or may not be acquainted with. The presentation course given to fourth and fifth year civil engineers at UNB is perhaps, one of the most beneficial parts of their curriculum and also, from a general consensus, one of the most interesting.

In closing, I hope that some of you 'budding' engineers try to encourage this attitude of becoming 'well rounded' by rearrangement of part of the engineering curriculum. I am sure that most of you would take advantage of the chance to change the engineering framework into a more conducive atmosphere for learning.

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## Integrate engineering and social sciences

The following was written by a University of Waterloo engineering student for the Engineering Congress in Montreal Feb. 14-16.

The status of the "professional engineer" must be raised to that of a true professional. He must take his place as a leader in our modern complex socio-technological society. As technology continues to reach out and force its influence onto every facet of contemporary living, the destiny of the professional engineer becomes more clear. The engineer is being challenged to take the initiative in controlling and managing a technical society.

To meet this challenge, as a leader and policy-maker for any form of society, he must have an open mind, that encompasses both the necessary physical disciplines and the invaluable social sciences and humanities.

At present the engineer is given a technical training with the expectation that society, experience, and time will supply the "liberal" phase of education. By this time it becomes obvious to him that courses in the humanities are essential. However, the solution to the problem of social leadership participating is not so readily apparent. If social experience is necessary then the university must become a community.

Universities today are controlled jointly by the provincial government and by the

corporate establishment using the Board of Governors as its vehicle for exercising its influence. The universities' potential ability to reflect upon our society is effectively regated. Students, staff, and to a lesser extent, faculty, do not have a strong voice in matters concerning the "raison d'etre" of the universities. A realistic community of scholars cannot exist under such circumstances.

Many students and academics all across Canada are calling for the institution of a single-tiered horizontal form of University government: a main Senate composed jointly of all groups concerned with the university community: students, staff, faculty, administration, and outside society. If it can be assumed that engineering students would become full partner in the university, then this new system would be a step towards preparation of the engineer as a leader.

A process must be found through which engineering students are made aware of our social problems. The Engineering faculty of tomorrow must not funnel students into a background of students that are products of our more 'liberal' primary and secondary schools.

In preparation, then, engineering schools must begin to integrate social science courses of relevant interest and context into the present curriculum framework. Discussions, debates, and the importance of individual opinions must be

stressed. The interactions of society's problems and engineering problems must be drawn to the attention of engineering students early, in order to initiate the evolution of a new breed of professional engineer who is socially and aesthetically aware of his total environment.

Perhaps this would entail a graduate in engineering leaving university with the degree of Master Engineer after seven years of a semi-co-operative course, with heavy emphasis, during the first five years, on humanities and extensive freedom of technical options based around an ever diminishing core course requirement. The first five years would make him a broad-minded individual — the last two years make him a specialist — a true engineer; socio-technological designer who is capable of integrating people and machinery for the betterment of society in general.

The length of this course may seem extreme but according to facts gathered by the American Society for Engineering Education, 65 of all engineers interviewed indicated a master's degree in their chosen field was the optimal level of training and education necessary. This course would naturally graduate men who did have this now optimal and, in the future, necessary degree of education.

The work periods would provide the student with realisms about what his role in society could be when he has graduated.

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