

Humanistic Aspects in the Education of Engineers

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Abstract - Introducing humanistic elements to the education process at technical universities is the main subject of this paper. Growing costs of education of engineers and increasing specialization cause that universities limit the number of non-technical subjects offered. One of possible solutions to this problem is popularization of the so-called alternative activity, which is the promotion of various forms of students activity outside the obligatory programme of studies. This pertains to area like culture, arts, sport etc. Alternative activity contributes to an active way of life, forms "technical intelligence" and is an antidote to pathologies, such as drugs or alcohol. Presented determinants, areas of activity, possibilities and limitations are based on the author's experiences at Warsaw University of Technology (Poland).

Index Terms – Alternative activity, education of engineering, humanistic aspect.

INTRODUCTION

Modern technology embraces virtually all areas of human life. Therefore, the question arises whether the process of education of engineers should be limited to passing on technical knowledge or whether additional humanistic subjects should also be included in the programmes of studies. The answer to this question seems obvious, especially since in many countries engineers constitute the so-called "technical intelligence" and the law regarding higher education speaks about the duty of education and formation of social attitudes of students.

This article outlines problems connected with introducing humanistic elements to the education process at technical universities. The following chapters mention the possibilities and limitations of curricula and discuss the so-called alternative activity, which is an invaluable and beneficial method of forming personality. Attention is drawn to the possibility of achieving additional goals, such as fighting addictions to psychoactive substances, which constitute a grief problem of the academic community.

The examples and solutions presented here have been based on the author's experiences at Warsaw University of Technology, the largest and best Polish technical university, with over 180-year long tradition.

NON-TECHNICAL SUBJECTS IN PROGRAMMES OF STUDIES

One of six demands of the Bologna Declaration deals with quality assurance in education in the European Higher Education Area [1]. During the implementation of the

Bologna Process, ministers responsible for higher education in European countries continuously set the priorities and directions of action. In the Berlin Communiqué, the ministers considered the development of interdisciplinary education as extremely important [2]. The completion of these tasks by technical universities is especially difficult due to the specificity of education of engineers and close connections with the economy of a country. Nevertheless, curricula have been extended to the so-called non-technical (humanistic) subjects for many years. Initially, these were subjects in the field of economics and management of production processes. The offer was gradually widened – students could choose sociology, philosophy, law, history classes and even religion studies. This broadened the knowledge of future engineers with elements that are vital to the functioning of the present civilization. The action was consistent with the intention of the document of the European Commission entitled *The Role of Universities in the Europe of Knowledge*, which defines the place and role of universities in the modern society [3].

Unfortunately, increasing costs of education of engineers and growing specialization cause that universities have recently limited the number of subjects on offer, especially the non-technical ones. To give an example, until recently the standards of education at Warsaw University of Technology (Poland) provided for four hours a week of humanistic subjects for 4-6 semesters at all faculties. Now there are only two hours a week for 2–5 semesters. Quite a common solution is the introduction of additional fees for such classes and treating them as facultative. This obviously limits the access for students and undoubtedly narrows the profile of the graduate of the university contrary to the expectations and challenges of the 21st century.

One of possible solutions to this problem is popularization of the so-called alternative activity at technical universities. The next chapter deals with this notion.

ALTERNATIVE ACTIVITY

Alternative activity in the education of engineers is the promotion and activation of various forms of activity of students outside their obligatory programme of studies. This pertains to areas like culture, arts, sport, active leisure and it should engage possibly the widest range of participants. It is necessary to involve student organisations and to cooperate with other universities, especially humanistic ones. Thanks to this, costs can be low and effects – excellent. Alternative activity also contributes to an active way of life, shapes positive attitudes and skills, and is an antidote to pathologies, such as drugs or alcohol. Such additional effects (intended or accidental) are termed in pedagogical sciences as hidden programme. If the main aim of alternative activity is

humanization of technical studies and formation of technical intelligence, then, quite possibly, beside the foreseen goal, we can achieve an additional target, such as fighting addictions. This is an intended effect but it seemingly has nothing to do with the activity in question, therefore it is a hidden programme. Participants of such activities are usually unaware of the additional aim and in most cases this unawareness is crucial for the success of the programme. The features of alternative activity described above have a profound meaning in the academic context. It is constituted by a specific group of adults with critical perspective to the reality and of high self-esteem. Even first-year students usually have fixed views, habits and their own attitude to psychoactive substances. Fight against addictions through “campaigning”, talks, frightening and other pedagogical methods is basically bound to fail. For this reason, alternative activity, along with the basic influence, seems to be a highly useful method of prevention of addictions in the context of universities.

Alternative activity can be directed at a narrow group within a given community; we then have a local aim in mind. At a university, such a group is, for example, first-year students, who are especially prone to addictions. By encompassing the whole academic community (all students and employees) with our actions we create a global aim, extremely difficult due to high personal differentiation, in terms of age, for example.

In alternative activity, it is also worth distinguishing short-term and long-term aims. Sudden situations and the demands of the moment constitute the former type and the latter results from an adopted strategy, development plans, forecasts and future needs.

I. Determinants

Undertaking any activity is determined by a number of factors. In case of alternative activity at a technical university, the very academic context creates specific conditions. It is a very critical community and at the same time a group aware of its importance and additionally, contrary to appearances, it is very varied – in terms of age, status, views and achievements. The offer of alternative activities must therefore be especially attractive, meet the needs and expectations of students and employees, simultaneously taking into consideration the time and financial possibilities.

In the academic context there are, of course, determinants which appear in any group, quoting the following as examples:

- personnel determinants – the possibility of engaging appropriate organisers of a given activity,
- material determinants – equipment and premises,
- financial determinants – availability and scale of financing sources,
- legal determinants – the formal possibility of commencing an activity.

A detailed analysis of all foreseeable determinants and limitations is indispensable for the success of activities undertaken. Nevertheless, in alternative activity it may sometimes be worth taking a risk, assuming ad hoc tasks,

which were created spontaneously, without “cold calculations”. Experiences in such cases are surprisingly positive and their effects exceed expectations as well.

II. Areas of activity

Statutory aims of every university are the education of students, the development of personnel and conducting research. However, a good university is much more than just didactic and scientific work. The “something more” are the areas of alternative activity. What areas of such activity can there be? Assuming the existence of the above-mentioned determinants at basically all universities, not only technical ones, one can widely promote, support and organise the participation of employees and students in such areas as:

- sport,
- recreation,
- tourism,
- culture,
- university media,
- organizations,
- academic circles,
- clubs,
- artistic groups.

The first three points mentioned do not need further comments. Attention should only be drawn to a few important aspects. First and foremost, the scope and range of such activities should be as wide as possible. “Mass” events should be organized – championships, interfaculty competitions, races, picnics, sailing courses, riding courses, dance lessons – at the same time, of course, publicising and promoting individual achievements, victories and records. Secondly, one should use all traditional events, such as Juvenalia, the celebration of the university, anniversary celebrations or create new ones, for example tournaments and championships for the rector’s cup, thematic outdoor events etc. Thirdly, one should make some effort (usually quite significant) of persuading employees to cultivate physical culture and especially to cooperate with students. And finally one may and should use the tourist and sport clubs operating at the university.

An extremely important area in alternative activity in the academic context of technical universities is culture. The hidden aim, fight against addictions, coincides here strongly with the blatant aim, which is the formation of intelligence, a part of which engineers truly are. Promotion of culture may occur in various ways, beginning with distribution of cheap tickets to the theatre, philharmonics or opera, through organization of artistic events at the university. The latter way is more effective as it introduces culture straight into the campus, and it takes place thanks to any type of concert cycles, festivals, artistic reviews. At the same time, one may “dispense” the level of difficulty, form tastes and needs and even activate the students’ and employees’ own activity. It is worth cooperating with artistic universities and before most, one should use the existence of one’s own artistic groups that will be discussed later.

Academic media have been undergoing a recent change; from simple newsletters to magazines of varied profile and graphics and the computer network has created new

opportunities, such as internet radio or internet television. Decreasing costs of printing and equipment enable to engage a larger number of “university journalists” and to widen the scope of influence.

A constant element of university life is the activity of organizations and scientific circles, with a special position and role of the students’ self-government. Supporting such activity means, among others, an incentive to activity that in the future may contribute to professional achievements. But before most, working in an organization or a scientific circle engages deeply its participants, leaving a small possibility of addiction to psychoactive substances. In addition, these institutions themselves should generate areas of alternative activity so by investing in their activity we obtain the effect of positive feedback.

Student clubs create a specific flavour of the university by offering to spend free time at a concert, disco or a social meeting. This formula is sometimes specific and most often it is connected with drinking beer. There arises then a question whether clubs may play any role in alternative activity, the aim of which is promotion of culture or fight against addictions? The answer is not simple but at least two aspects seem to be encouraging: firstly, clubs may teach a certain “culture” of consumption of alcohol; secondly, university clubs may operate under control, which minimises the risk of distribution and using of drugs.

University artistic groups have already been mentioned when discussing culture. It should be emphasized that their existence is an opportunity for people gifted artistically and the effects of their artistic work give notable promotional benefits to the university.

III. Possibilities and limitations

Performing alternative activity, even in a small area of academic life, is closely connected with human resources. It is necessary to persuade the authorities of the university of the need of such work, especially among people responsible for student affairs. With the approval of the senate and faculty boards, there will be employees and students who will passionately take up organisation activities. Especially so as it is actually all about the widest possible promotion in the academic context of the possibility (offered by the university) of spending free time and fulfilling one’s life passions. The prevention effect in the fight against addictions will occur spontaneously, it is after all a hidden programme.

The question of material basis is not so critical as the financing issue. Even a small university has some free rooms, audio-visual or sports equipment at its disposal. As for financing, it is advisable to allocate a fund for cultural-pedagogical activity of students and Ph.D. students in the budget of the university. The division of this fund for different purposes may be done by the students’ and Ph.D. students’ self-government, with the approval of the appropriate vice-rector. Therefore, the above mentioned approval of the senate when deciding on the budget and a reasonable division of the cultural-pedagogical fund may largely solve the problem of financing. Perfect sources of income are obviously donations, sponsoring and other external subsidies.

It is probable that financing of such activity at university may raise doubts and even objections. It is therefore important to ensure appropriate provisions in the university law (the statute, the resolutions of the senate, regulations of funds implemented by way of the rector’s directive) which will secure on the one hand, proper operation and on the other hand, ease controversies and eliminate possible conflicts.

CONCLUSIONS

Limitation of the offer of humanistic subjects by technical universities leads to a dangerous narrowing of knowledge of future engineers. Modern civilization demands interdisciplinary education. Alternative activity faces this challenge and may complement the didactic process, whose “end product” – the engineer – will deserve the name of “technical intelligence”. Alternative activity must have a wide range in the context and must be carried out consistently. This requires involvement, initiative and patience.

Basing on the author’s experience the following steps should be taken, in order to achieve success:

- integration of students organizations (common projects),
- introduction of precise rules of finances allocation and distribution,
- cooperation with local (city, region) administration,
- wide-ranging promotion
- cooperation with graduates,
- cooperation with others universities,
- searching for supports.

The above actions should be coordinated at university by the team of 3-5 people, consisting of students and academic teachers.

The university is a unique place and studies are a unique time in students’ life. An attractive, easily accessible and quality offer of alternative activity should integrate the academic community, humanise future engineers and reinforce the image of the unique mission of the university as a promoter of knowledge and quality lifestyle.

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