УДК 378

HUMANISTIC ASPECTS OF EDUCATION OF ENGINEERS UPON THE EXAMPLE OF WARSAW UNIVERSITY OF TECHNOLOGY

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This article describes complementation of the education process of students of technical fields with widely understood humanistic knowledge, and culture in particular. Due to rapid development of technology and increasing globalisation, study profiles have become narrower and specialisations are deeper, which in turn leads to a very technocratic way of design and manufacturing of equipment, everyday objects, as well as civil engineering and urban planning. A basic tool to prevent this phenomenon is the general offer of social courses in technical fields of study. A very interesting solution is promotion of so-called fringe activity in the student community, which may also create and promote widely understood culture. General characteristics of these issues, and the definition and description of the concept of fringe activity, have been complemented with a case study of solutions implemented at Warsaw University of Technology. This oldest Polish technical university initiated popularisation of humanistic knowledge both in the form of regular classes, and by organising and promoting any type of creative and artistic student activity of the character of fringe activity. The presented solutions, achievements and experiences in this field should be promoted. The example of Warsaw University of Technology clearly shows the great potential higher technical education has in this area. A good use of this potential gives a chance for future engineers to gain the best professional qualifications along with deepened humanistic knowledge, also in the area of culture.

Keywords: technical studies; humanistic education, culture, fringe activity, technical intelligence.

ГУМАНІСТИЧНІ АСПЕКТИ ОСВІТИ ІНЖЕНЕРІВ НА ПРИКЛАДІ ВАРШАВСЬКОГО ТЕХНОЛОГІЧНОГО УНІВЕРСИТЕТУ

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Дана стаття присвячена питанням збагачення навчального процесу технічних вишів гуманістичними елементами, пов'язаними, перш за все, з культурою. Технічний прогрес і глобалізація призводять до яскраво вираженої вузької спеціалізації вишів, що в свою чергу є причиною технократичного підходу до проектування і виробництва товарів народного споживання, а також до будівництва і міського планування. Впровадження в навчальний процес технічних вишів предметів, пов'язаних з соціологією, є одним з інструментів попередження цього явища. Ефективним способом розв'язання даної проблеми є також популяризація так званої альтернативної діяльності в студентському середовищі, завдання якої полягає у сприянні всьому, що якимось чином пов'язано з питаннями культури. Визначення і загальна характеристика альтернативної діяльності наведені в тематичному дослідженні, проведеному у Варшавській Політехніці. Цей найстаріший в країні політехнічний виш ініціював поширення гуманістичних знань як в формі регулярних занять, так і за допомогою організації та просування різної творчої і художньої активності студентів, яка містить елементи альтернативної діяльності.

Представлені рішення, досягнення та досвід в даній сфері варто популяризувати. Приклад Варшавської Політехніки переконливо свідчить про потужний потенціал технічних вишів. Правильне використання даного потенціалу дозволить майбутнім інженерам здобувати вищу технічну освіту в комплексі з глибокими гуманістичними знаннями, в тому числі в галузі культури.

Ключові слова: технічний ВНЗ; гуманістичне навчання; культура; альтернативна діяльність; технічна інтелігенція.

INTRODUCTION

The social and political changes that took place in Poland after 1989 made public life subject to laws and mechanisms completely different from those before the political transformation.

Complementation of compulsory courses for students of technical sciences with subjects from other areas was to help young people learn about many issues connected with human existence and to equip them with the ability and need of active participation in social life. Creation of the so-called "technical intelligence", who have professional knowledge and skills connected with modern technological achievements, and who are also sensitive to non-material values, such as beauty, ethics, arts etc., turned out to be quite a challenge. It needs to be stressed that in the educational context, humanistic courses are treated as the core of culture consciousness, showing the multi-level and complicated human nature, and demonstrating cognitive passions of individuals. Humanistic courses, by showing the confrontation between the psychic of the mind and soul and the reality of our world, allow us to save the past from oblivion and protect us against negative effects of globalisation and universalist trends[1]. Very often, however, the place of values reminding of the past and "breaking the individual away" from the more and more popular "here and now" is taken by the trend which does integrate groups, which helps to acquire knowledge and spread scientific and technical achievements, but it does that at the expense of uniformisation of norms and standards, by universalising human and culture rights[2].

The author aims at characterising the factors that enable to keep the balance between the humanities and technical sciences in the education process of students of technical fields. The aim of the article is to present humanism as one of the most important pillars that underlie appropriate and safe technological progress for mankind and to present arguments that show that teaching hours devoted to shaping the "humanist soul" of engineers are not lost. On the contrary, they may be a kind of an antidote to the naive belief, more and more popular in the society of the era of globalisation, that a growing number of constantly improved devices, progress in medicine and lack of political persecution are the "keys to happiness" and the only guarantee of widely understood human freedom.

A very interesting tool which widens the interests of future engineers is the so-called fringe activity in the student community. Appropriately promoted and supported by the university, it is an important element of shaping "technical intelligence", often more effective than humanistic courses in the study programme. For many years, Warsaw University of Technology has been using fringe activity very widely and successfully, which is presented in detail in this paper.

The sources used in this article are monographs and publications on educational issues at the beginning of the 21st century, as well as programme offers and internal documents of Warsaw University of Technology.

FUTURE ENGINEERS AND HUMANISTIC ISSUES

When analysing the attitudes of students towards social and cultural education at technical universities, one can often see their reluctance towards these issues. This phenomenon stems from dynamic technological progress. The modern man, who uses the latest achievements of science and technology, experiences progress of civilisation and material culture to a much greater extent and at a greater speed than ever before. This does not change the fact, however, that apart from positive consequences, technology progress has had a number of negative implications. Growing up in the time of a great tele-information boom and of new possibilities, young generations have created the so-called IT society, based on consolidation of mass communication means and a change of the method of communication in public space[3]. The Internet and mass computerisation enable instant search and sending of any kind of information, both in the form of a text and of an image. The introduced innovations resulted in a change of the status of information in the society. From an additional element, part of existence, information has turned into the greatest carrier of value for the modern society[4]. According to globalisation enthusiasts, the ability to use the computer in everyday life gives the feeling of belonging to the world. This attitude of globalists shows that they perceive only the material aspect of technology. They do not notice, however, that neglecting the rule of even development of intellectual and internal needs of the human is a threat

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[1] B. Kuczera-Chachulska, *W sprawie narracji*, [in:], *Edukacja humanistyczna w nowym stuleciu. Rola humanistyki w kształtowaniu świata wartości i postaw młodych Polaków,* K. Chmielewska (ed.), Wrocław 2006, p. 6.

[2] B. Ecler-Nocoń, *Globalizm: pedagogiczne nadzieje i zwątpienia*, [in:], *Edukacja wobec wyzwań kulturowo-cywilizacyjnych*, J. Kojkoł, P. Przybysz (ed.), Gdynia 2002, p. 1.

[3] R. Maćkowska, *Wartości humanistyczne w procesie globalizacji*, [in:], *Edukacja wobec wyzwań*..., op. cit., p. 8.

[4] Ibidem.

to existential nature[5]. More and more often, a much deeper than ever generation gap is visible, expressed by the "strive towards further education" or deep frustration among elderly people. Among young students, especially of technical fields, there is, in turn, much greater concentration of attention and energy on the forms of possession, which often leads to alienation. In their opinion, this alienation from the society is a natural "price for success"[6]. Lack of orientation in the situation of the society one belongs to may lead to disappearance of altruistic attitudes.

Making use of scientific and technological achievements often requires thorough and specialist knowledge. Being aware of the fact that gaining knowledge and skills in the field of technology may open perspectives for professional development, future engineers are not motivated to concentrate on humanistic values as well. In the last decades, there has appeared a generation of people for whom culture is something alien, impenetrable and unfriendly and their social contacts or belonging to subcultures do not influence the real content of the socially realised cultural contacts[7]. By giving in to the dominating trend to shape the modern society as a technological society, students are not always aware of the fact that the foundation of the knowledge acquired by them is rooted in humanistic areas – philosophy, ethics, anthropology, sociology, history etc. The challenge for humanistic education is thus not control of the social and cultural transformation, but stimulation of IT revolution in the full understanding of this term. Young people do not know the world before the transformation. [...] They know, however, the world of free access to information, free word, open borders. The world open thanks to rapid communication, instantly sent sounds and images, more efficient electronic media. [...]. A great challenge for those who wish to take them to the world of values is presentation of humanistic information in an inspiring way as an area that teaches people responsibility for their education and shapes the awareness of the difference between high and popular culture[8]. With such a strong link between globalisation and technocratisation of life, cultural education is the only strategy for rescuing people from the chaos of life. Only in this way can one present culture to those reluctant towards humanistic values as a multi-faceted term, expressed as "a strive towards obtaining individual expression in actions and words, as service to values, as obtaining harmony between aspirations and the everyday world [...], and the education of the human as a process of internal growth [...] happening through creative activities"[9].

The arguments presented above clearly show that domination of globalisation, so popular both in the society and at universities (especially technical ones), has contributed to marginalisation of the role of the humanities in the modern world. Treating the humanities as a term representing only non-material values is an example of the superficial attitude of globalists, which is a vital element that disturbs the balance between technical sciences and the humanities at technical fields of study. Enthusiasts of the concept of globalism in education do not take into account the primacy of humanism over technology resulting from its special role in this area. It is humanism that points to aims, by evaluating them and by transforming them into social mechanisms that stimulate the development of technical sciences. The responsibility of humanists for technology is significant. On the one hand, they may not allow excessive influence of technocracy on human life – there could be great social stratification, and on the other hand, they know that too much limitation of the above mentioned progress would complicate shaping social attitudes in which technology is just a means to an end, i.e. to learning about and developing values that come from the achievements of culture and civilisation. There arises then the basic question – how can one efficiently and effectively "infect" future engineers with humanistic knowledge, which would significantly influence their projects that change our life so quickly?

IGENERAL SOCIAL EDUCATION UPON THE EXAMPLE OF WARSAW UNIVERSITY OF TECHNOLOGY

One of the six provisions of the Bologna Declaration talks about the quality of education in the European Higher Education Area [10]. When implementing the Bologna Process, ministers

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[5] *Humanizm i technika*, M. Dietrich, (ed.), Warsaw 2006, p. 4.
[6] A. Łapa, *Oblicza globalizacji: od destrukcji do umiarkowanego optymizmu*, [in:], *Edukacja wobec wyzwań*..., op. cit., p. 7.
[7] J. Kargul, *Czy brak szans edukacji kulturalnej*, [in:], *Edukacja zorientowana na XXI wiek*, J. Gajda (ed.), Lublin 2000, p. 5.
[8] M. Poprzęcka, *Internet i wartości*, [in:], *Edukacja humanistyczna w nowym stuleciu*..., op. cit., p. 10.
[9] J. Kargul, *Czy brak szans edukacji kulturalnej*, [in:], *Edukacja zorientowana...,* op. cit., p. 2.
[10] *www.polibuda.info.pl* [accessed on 28.08.2015]

responsible for higher education in European countries set priorities and action targets many times. In the Berlin Communication, they pointed to interdisciplinary education as a very important area to be developed[11]. Realisation of these tasks by technical universities is especially difficult due to the specificity of education of engineers and close links with the economy of the country. Nevertheless, for many years, educational programmes have been complemented with so-called non-technical courses (humanistic courses). At first, these were courses on economics and production management. Then, the offer was broadened; students could choose courses on sociology, philosophy, law, history and even religion studies. This widened the knowledge of future engineers with elements vital for the functioning of modern civilisation. This goes along with the aim of the document of the European Commission *The role of universities in the Europe of knowledge*, which shows the place and role of universities in the modern society[12].

Because of the awareness of real threats to the appropriate development of personality and character of young people at technical universities, in Poland measures are taken in order to make students familiar with the importance of humanism for human existence, and at the same time to achieve balance between civilisation progress and so-called perennial values. The choice of Warsaw University of Technology as a representative example that reflects the mentioned strive to include humanistic elements in programme curricula, is not accidental. Already before the first World War, this largest Polish technical university introduced economic, social and humanistic courses to its technical education. In the period between the world wars, an advocate of the concept of a wide view on the tasks of engineers was professor Karol Adamiecki, whose theory of harmonisation of work organisation in industry was recognised in Poland and abroad[13]. According to this theory, the work of people of technology required symbiosis with humanistic values, therefore the education of engineers should cover this area as well. After the Second World War, non-technical courses at Polish technical universities were limited to Marxist philosophy and so-called political economics. At the beginning of the 1990s, after the political transformations of Eastern Bloc countries, Warsaw University of Technology started to introduce significant changes in humanistic education of future engineers. The College of Social Sciences and Administration (in 2008 transformed into the Faculty of Administration and Social Sciences), created at the University, offered a wide range of courses as one of the first faculties in Poland. Students can choose courses on, for instance, philosophy, sociology, management, marketing, law, history of architecture, multimedia history of science and technology. The issues included in these courses are organised so as to familiarise the students with public and economic life, as well as with civilisation achievements. And so, in philosophy courses, students learn about, for example, the essence of human existence, methods and limitations of cognition and the main concepts of thinkers of historical epochs. Additionally, it is possible to choose a course devoted only to analysis of philosophical concepts against modern reality. Enrolling on sociology lectures, future engineers may become familiar with the role of culture in shaping human personality, social divisions and norms in the community and the concept of state and statehood. When attending sociology classes, they may acquire knowledge on so-called management sociology that covers work organisation in companies and methods of management of "resources of human potential and skills". We also need to mention a variety of courses on copyright, economic law, local authority law etc. Tutorials on the history of architecture, in turn, teach students about the history of religious and urban buildings over the centuries and architectural styles, which are the cultural and technical wealth of the society. Another interesting course is "Multimedia history of science and technology", where in a very attractive form, the greatest achievements of mankind are presented against historical realities and events.

The programme also includes courses on the history of economic thought, history of political and administration thought, history of social and economic thought, business ethics, protocol in diplomacy etc.

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[11] *The European Higher Education Area - The Bologna Declaration of 19 June 1999: Joint Declaration of the European Ministers of Education; www.bologna-bergen2005.no. [accessed in 02.2015].*
[12] *Realizing the European Higher Education Area - Communication of the Conference of Ministers Responsible for Higher Education in Berlin on 19 September 2003, www.bologna-bergen2005.no. [accessed in 02.2015]*
[13] *M. Jakubiak, Akademickie szkolnictwo techniczne w Drugiej Rzeczypospolitej, Warsaw 2015, p. 135.*

The programme offer in the field of the humanities is constantly updated and complemented with new courses[14]. It needs to be stressed that engineering students of all faculties may use them within their non-technical course allocation. Recently, a growing interest of students in these issues can be noticed and many faculties have started to offer their own courses where the humanities and a given technical field meet.

FRINGE ACTIVITY IN THE STUDENT COMMUNITY

A statutory aim of each university is education of students, development of the staff and doing research. A university, however, is much more than just teaching and research. This "much more" is actually the type of activity referred to as fringe activity. Fringe activity in the area of university education is defined as promotion and animation of various forms of student activity, beyond the obligatory study programme[15]. This includes areas such as culture, arts, sports, active recreation and by definition should include as many participants as possible. This activity should be mainly initiated by students, associated in various organisations and supported by academic staff and university authorities. An important role is played by cooperation among universities, and in particular the help and involvement of artistic and sports universities, etc. Thanks to this, maximum results may be obtained at minimum costs. Fringe activity promotes active lifestyle, shapes positive attitudes and it is even an antidote to pathologies, such as drugs or alcohol. In pedagogical sciences, such additional effects (intended or accidental ones) are referred to as the hidden programme[16]. If the main goal of fringe activity is humanisation of technical study and creation of technical intelligence, then apart from the set goal, one may very probably achieve an additional result, such as fighting addictions. This is an intended effect, though seemingly not connected with the activity itself, and therefore it has the characteristics of the hidden programme. Participants of such activities usually are not aware of the additional goal, and in most cases it is this lack of awareness that determines the success of the activities[17].

Taking up any activity is determined by a number of factors. For fringe activity at a technical university, the academic community itself creates specific conditions. It is a very critical community, at the same time aware of its position, and greatly varied – in terms of age, views and achievements. The offer of fringe activity must then be especially attractive and answer the needs and expectations of students, taking into account their time and financial constraints. There are also other "classical" constraints, such as staff, material, financial and legal constraints. Support from university authorities, relevant statutory regulations and appropriate allocation of funds devoted to cultural and pedagogical activities of students allow to start fringe activity at any university, not just a technical one. Despite the constraints listed above, one can thus widely promote, support and animate student activity in areas such as sports, recreation, tourism, culture, university media, research organisations and associations, clubs or artistic groups.

The first three areas do not call for additional comments; physical activity is an indispensable part of human life, which allows to keep fit, also intellectually. Creation of humanistic attitudes is also promotion of "physical culture". A few important aspects need to be mentioned here. Firstly, the range and extent of these actions should be as wide as possible. "Mass" events should be organised – tournaments, interfaculty competitions, runs, picnics, yachting courses, horse-riding courses, dance classes – and at the same time, individual successes and records should be emphasised and promoted. Traditional academic events may be used, such as Juvenalia, university celebrations, anniversary events, or new ones may be created, for example Rector's cup tournaments and competitions, thematic outdoor events etc. And finally, tourist and sports clubs, active at the university, may and should be used.

An area of fringe activity of great importance in the academic community is culture. Direct participation in culture to the greatest extent achieves the goal of creating the social stratum of intelligence, which engineers belong to. Culture may be promoted in a number of ways, starting with distribution of cheap theatre, philharmonics or opera tickets, through organisation of artistic events at the university. The latter way is more efficient since it puts culture right on the academic

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[14] Warsaw University of Technology, College of Social Sciences and Administration, Programme Offer 2006-2008, Warsaw 2006, p. 9.
[15] A. Jakubiak, *Humanistic Aspects in the Education of Engineers*, International Conference of Engineering Education ICEE-2007, Coimbra, p. 124.
[16] Ibidem.
[17] Ibidem.

campus, through various types of concerts, festivals, artistic events. At the same time, the level of difficulty may be "adjusted", tastes and needs may be created and even students' own activity may be encouraged. It is a good idea to start cooperation with artistic universities and firstly, one should use the existence of university's own artistic groups. A special type of culture, often referred to as student culture, is generated by student clubs. They create a special atmosphere of each university, and offer spending free time in the form of entertainment, concerts, discos or social meetings. University artistic groups have already been mentioned; it also needs to be mentioned that their existence is an option for artistically gifted people and the effects of their creative work bring the university promotional benefits.

Recently, academic media have undergone a deep change; simple bulletins have been transformed into magazines of varied profile and layout and the computer network has created new opportunities such as internet radio and TV. Decreasing costs of printing and technical devices allow to engage a bigger number of "university journalists" and to increase their impact.

A constant element of university life is the activity of student research organisations and associations, with a special position and role of student self-government. Support of this activity is, for example, encouraging work that may in future result in professional achievements. In addition, these institutions themselves should generate areas of fringe activity so by investing in them, we get positive feedback.

Warsaw University of Technology is one of the technical universities that especially widely realises fringe activity described above, with good results and many spectacular achievements. In the area of sports, recreation and tourism, the University offers its students all possible forms of activity; many clubs and associations work there, such as Student Sailing Club, Horse-Riding Club, PTTK Polish Tourist and Sightseeing Society clubs and the AZS Academic Sports Club. Warsaw University of Technology has a sports stadium, swimming pool and tennis courts in the centre of Warsaw, mountain chalets "Koliba" in the Bieszczady mountains and "Chatka" in the Beskidy mountains, two sea yachts, "Riviera" dance school and student clubs, such as the legendary "Remont" and the best known (also internationally) "Riviera" club. Students eagerly take advantage of this offer and in many fields have achievements on the national scale. An example here is the only academic team in men's volleyball league – AZS Warsaw University of Technology. An interesting initiative of the WUT Students' Self-Government in the area of widely understood student culture was the 2002 Agreement of Warsaw Universities, which each May organises Warsaw Juvenalia in the form of a huge parade in the streets of Warsaw for students of all Warsaw universities and an academic town in Pole Mokotowskie, open to everyone. Another very creative project organised by the Committee for Culture of the WUT Students' Self-Government and National Students' Association, also since 2002, is the December Academic Artistic Event GAPA, which promotes student musicians, poets, photographers and computer graphic designers. A great cultural role is played by student artistic groups. At Warsaw University of Technology, six such groups are active; they have the status of University organisational units and involve circa 500 students each year. The oldest one, established in 1951, is the Song and Dance Company of Warsaw University of Technology, one of the best amateur groups in Europe of its type. A younger group, set up in 1998, WUT Academic Choir, has recently won all choir competitions in Poland. Artistic groups also include Warsaw University of Technology Student Theatre and Warsaw University of Technology Band "The Engineers Band", both set up in 2005. The band does not only play at University balls, but also outside the University in Poland and abroad.

The most interesting and unprecedented cultural achievement of Warsaw University of Technology is organisation of a cycle of concerts "Great Music in the Small Hall". From October 2002 to April 2016, 89 concerts took place, given by well-known orchestras and soloists, as well as young musicians, choirs and academic bands from all over Poland. The cycle is renown as an attractive form of promotion of so-called high culture at Warsaw University of Technology and promotion of young talented performers. The concerts attract both WUT students and employees and many guests from other academic communities. The prestige and popularity of the cycle attracts each time over 400 people to the Small Hall, and so-called "great concerts", which due to the size of the performed piece and the number of performers, take place in the WUT Great Hall, attract almost 1500 people. Many young artists who performed in Great Music soon made a stunning career. A great example is Łukasz Borowicz, who in 2003, right after his studies, at the fifth concert, led the Polish Radio Orchestra and a 200-singer academic choir in a wonderful performance of Carl Orff's Carmina Burano, is now one of the greatest Polish directors. Great

Music was the stage for, i.a., the National Philharmonics Orchestra, Orchestra of the Warsaw Chamber Opera and the Beethoven Academy Orchestra under the auspices of Krzysztof Penderecki. A few concerts were great musical events, for example the Polish premiere of the musical "Wonderful Town" of Leonard Bernstein (50th concert on 31 January 2010) or the tenth Polish performance of the 8th Symphony of G. Mahler (67th concert on 16 March 2012) with over 500 performers. On 5 December 2015, at the closing of the 100th anniversary of teaching in Polish as the language of instruction at Warsaw University of Technology, Krzysztof Penderecki directed the performance of his great piece "Seven Gates of Jerusalem". Great Music in the Small Hall also plays the role of an extremely important "concert stage" for artistic groups of Warsaw University of Technology; all spring dates are reserved for these groups. Performances in a renown and popular cycle are a very important factor that encourages students to do artistic work. It is estimated that since the beginning of Great Music, the concerts were attended by over 50000 people, mostly students and employees of WUT and other Warsaw universities. Enthusiastic opinions and reviews confirm the view that Great Music in the Small Hall fulfils its role and in an extraordinary way is part not only of fringe activity, but also of the history of Warsaw University of Technology.

The above description of fringe activity at Warsaw University of Technology should also be complemented with information about student media, such as WUT Internet TV or "Radioactive" – student internet radio. Work of over 180 student research groups, whose achievements are often mentioned in media, is also very important. Undoubtedly, for years Warsaw University of Technology has been successfully doing and promoting fringe activity. So many initiatives realised to a great extent and for a long time are the result of smooth cooperation of University authorities, students and particularly involved academic teachers.

CONCLUSION AND PROSPECTS FOR FURTHER RESEARCH

On the basis of the presented analyses and facts, it may be stated that with political, social, economic and technological transformations, humanistic education of engineers, though controversial at times, has become necessary. It is clear that ongoing globalisation has deepened the process of *"fascination with technology, which definitely enables rapid communication in many areas, but somehow takes away humanistic experiences. [...] The modern man wants fast information. This is provided by technical devices"*[18]. Thanks to this, one may have a better job, professional qualifications, social position. An uncontrolled development of the tele-information society and lack of appropriate balance between the development of tele-information fields and areas presenting lasting values handed over from generation to generation may lead to a significant social stratification in intellectual and mental terms. Limiting interests only to sciences leads to a lower level of general knowledge and as a result, to the loss of the ability to have reasonable opinions on general social issues. New areas of science require new imagination – engineers may draw even from modern artistic practice. Science and arts can create joint projects, which are based on modern technologies and mankind-friendly[19].

Technical university teaching in the 21st century should thus aim at avoiding education only in a narrow specialisation. Modern education of students include multiple aspects of mechanisms and laws that "rule the world" and that value the humanities as an area of knowledge which directs the development of technology towards satisfying human needs, the realisation of which is necessary for a good life. This challenge may be met by appropriate humanistic education of future engineers, which shapes mental, intellectual and creative characteristics. Interdisciplinary orientation is becoming an integral element of teaching and research. One should aim at study programmes that initiate problems on the border of engineering sciences, the humanities, social sciences and philosophy[20].

Widening the profile of education is a chance to counteract negative phenomena that occur with rapid civilisation progress in technical areas. Skilful preparation of the study offer is the first step towards preventing threats connected with dehumanisation of the society, a side effect of global and controversial technocratisation of the today's reality. An additional, very effective

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[18] W. Goriszowski, *Edukacja humanistyczna celem i zadaniem współczesnej cywilizacji XXI wieku*, [in:], *Edukacja Humanistyczna - wyzwania i rzeczywistość*, T. Strawa, D. Kierszka (ed.), Szczecin 2002, p. 3.
[19] A. Radomski, *Humanistyka w świecie informacjonalizmu*, Lublin 2014, p. 41.
[20] T. Stępień, *Filozofia i humanistyka w edukacji inżynieryjno-technicznej*, [in:], "Analiza i Egzystencja", no. 25, 2014, p. 176.

element of shaping humanistic attitudes of future engineers is definitely wide fringe activity, the assumptions, aims and methods of which have been discussed in short in this article.

The conflict between the human's internal needs and the requirements of the modern world is definitely difficult to solve. Nevertheless, we are not powerless. We are searching for effective solutions, like at Warsaw University of Technology, where thanks to the efforts of the teaching staff and student organisations appropriate conditions have been created for acquiring elements of humanistic knowledge. This aim is realised both through an interesting teaching offer, and wide fringe activity, accepted and successfully realised in the academic community. Such actions are taken at practically every Polish technical university, which clearly shows that the academic community understand the problem. There is thus a real chance to enrich the ongoing technocratisation and globalisation with humanistic values, necessary for sustainable development of mankind.

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