

## MEDICAL EDUCATION

# Universities and their educational mission in the 21st century: Medical education innovations at Comenius University Faculty of Medicine

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## What are the universities for?

John Henry Newman, the Oxford academic, proposed that the ideal university is a community of thinkers, engaging intellectual pursuits for no other purpose than an end in itself. This idea is echoed in the writings of Harvard University President Drew Faust: „A university is not about results in the next quarter; it is not even about who a student has become by graduation. It is about learning that molds a lifetime; learning that transmits the heritage of millennia; learning that shapes the future“. These concepts can help guide us in decisions about the future of our universities in the context of the Comenius University centenary and rapid changes in human society since 1919.

## Will traditional universities be history in 100 years?

Profound changes in European society have transformed the role of the ‘traditional’ university, forcing implementation of new rules to the education system. Traditional values are compromised by massification, commercialization, and political correctness. During past decades a continuous growth towards “universal higher education” is observed in the developed societies increasing students’ enrollments and building knowledge-based societies. The amount of information is dramatically increasing due to technical advances in research that brings the necessity for curricula modification and new approaches to teaching. The traditional universities are pressed to change their ivory towers of elite production to increase the proportion of higher education-trained graduates that opens up opportunities for decentralization of responsibilities, dispersed innovation and new modes of division of labor. The growing pressure for relevance of teaching and research is differently interpreted and absorbed by individual higher edu-

cation institutions. Growing attention paid to the immediate needs of the society tend to neglect the traditional functions of independent research and education and opens up the citizen participation in research which can enlarge the societal responsibility of universities in the near future.

But do we still have the right to call higher education institutions universities, if we are neglecting their traditional functions of autonomous, independent research and teaching institutions? There are many definitions of institutional autonomy and academic freedom. In its most basic understanding, it means that universities are free to manage their staff, formulating and designing their academic programs, raising and managing funds without outside interference, and last but not least, proclaiming freedom in research topics and dissemination of research outcomes and knowledge as widely as possible.

In 1999 in Bologna ministers of Education from EU countries agreed on principles to unify the structure of education and to facilitate education of students, teachers and researchers and to promote mobility and internationalization. Education in the EU should become a unifying factor, moving humanity forward through the official EU motto – UNITY and DIVERSITY - implying that together the EU countries stand strong even though they have different backgrounds. The very significant transition from the Humboldtian model to the Lisbon model and the consideration of universities as international instead of national entities initiated globalization of the education market. Universities are asked to educate the masses, not to cater to the elite few. They are asked to contribute to technological prosperity and socio-economic change and growth. The EU strategy 2020 has raised the goal to award a higher education diploma to a minimum of 40% of EU citizens between 30-34 years of age. Although the concept is noble – the more educated the population, the more peaceful the world - there is also the likely unintended consequence of devaluating higher education. The changes caused by the transition of national states and their societies to a globalized, networked, technologized and knowledge-based society have been fast. These changes have fundamentally influenced the education system and the measures by which we evaluate our universities. Government representatives realize that the knowledge economy

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requires top research measured by publications, citations and patent production. More recently quality measures of all operations have driven the assessment of our higher institutions. The question remains as to which parameters are most crucial to determine the best universities.

Business and industry increasingly demand research and teaching relevant to the needs of the market. Many universities excel in delivering commercial outcomes for research. They build start-up companies, sign collaborative research agreements with industry partners, and share in inventions and patents. Commercializing university research is one of the main challenges. But money cannot be the only measure of university strategy. Science is not business, science must serve society at large, and knowledge has to be seen as a part of the common good. European universities are viewed as knowledge producers for networked society. But we have to keep in mind that universities independent of the country in which they operate have to preserve their identities as institutional and national defenders of culture. This makes universities a very distinctive type of organization - knowledge generators. And in this role, introducing economic interests could be extremely harmful. On the other hand, fundraising and generating income are becoming key areas of activity for the universities' leadership. Moreover, universities are no longer exclusively public or non-profit. The private sector is looking for profits in academic institutions and is pushing them to adapt research to serve the needs of the market.

### **Universities in a digital era**

The world is migrating intellectually to a digital world and is still trying to understand the social and emotional consequences on humankind and culture. Until recently, universities had been offering higher education in the same way for centuries. Now, digital media are incorporated throughout academia, used in both the production and distribution of knowledge. There is more scientific knowledge produced every day and thanks to the internet, we all have immediate access to it. An increasing amount of knowledge is produced and tested on computer simulations and more general knowledge is produced in video form. Therefore, teaching is said to be more efficient when delivered on-line and research is best presented through science parks and related technologies. Our brain is a work in progress. From childhood to old age, it is continually modifying its structure and connections to support behavioral flexibility and plasticity. The same process goes on in education. The technology used in education develops over time, students studying at universities today are different compared with previous generations. They do not like reading long and difficult texts, they are more dynamic in living and also in studying. They like stories and movies and are impatient listening to professors deliver their lectures. Technology has had an irreversible impact on higher education institutions. E-learning, virtual universities, distance and flexible education have emerged. Some institutions provide higher education programs through electronic media, some provide online learning as a part of their extended courses while others provide only an online curriculum.

### **Universities in a globalized world**

Countries all over the world aspire to have high-skill, high-value societies and knowledge economies. The exceptional value of knowledge is that it has no geographical boundaries, and that is very challenging for the global society. This is how UNESCO World Report (2005) defines the knowledge society: "A knowledge society generates, processes, shares and makes knowledge available to all members of the society which results in highly valued benefits as a sustainable environment, good healthcare and different forms of cultural expression." Today's world is in constant motion. The needs of the globalized society are changing continuously, and traditional education systems can no longer prepare students for what they will face in the work environment. There is a clear need for a new type of learning, which together with knowledge will transform learning to mastering specific skills, social networking abilities, digital competencies and multi-cultural flexibility and tolerance. Massification of education and the fact that the whole world is in constant flux makes students and teachers move with it. With increased access to published data and the introduction of open science universities are at risk of plagiarism and authorship fraud. In these circumstances, universities find it necessary to include more courses on ethics in their training, and to argue for establishing a code of conduct. Our physical world is governed by exceedingly complex processes, as increasingly understood by the field of quantum physics. The spiritual and moral realm, reflected in the term culture, is led by processes that are still developing; perhaps at the same pace as human society itself. Human conscience and reasoning are then a constituent of culture. All religions, as components of culture, compel people in a variety of ways to be good, honest and respectful of social rules all the time and everywhere; not only in fear of the Almighty, but also because it leads to human prosperity.

The new role of universities is an educational model based on partnership and networking in local, regional, national and international frames. The growing cooperation of scholars across institutions and countries, the increasing mobility of students, the frequent and rapid virtual communication and other factors related to new technology and internationalization are likely to reduce the weight of the individual location for the quality of research and for the competence of the individual students. On the other hand, the universities are obliged to raise the cultural level of the local community. They also help to raise the employment in a particular region and perhaps limit the outflow of young graduates (brain-draining). Thus, the universities give their specific image to the region and by creating science and technology parks, creating closer links with local industry, promoting regional economic development and improving social cultural and environmental development.

Education and research are now global and English is the lingua franca in education and science. A common language enables joint and dual degree programs among the universities not only within the EU, but also among universities across the Atlantic and in Asia. Internationalization of the universities has also extended to specialized summer schools, and this has led to innovations through

critical thinking in an international environment. Knowledge and education have been by now changed to a massive phenomenon. Globalization of the world offers new possibilities, but at the same time brings new challenges. Internationalization beyond the borders of EU has become a reality and continues to be a priority for the large majority of European institutions of higher education.

European universities are facing competitive pressures due to fewer students from their own countries related to the declining birthrate. Nearly all universities are responding by recruiting international students, establishing strategic partnerships and generally reconsidering the ways in which they interact with the wider global academic community. The arrival of large numbers of refugees and the question of access for recently arrived migrants is likely to become an additional aspect of higher education internationalization.

A further challenge is that in our globalised world there is an increased need for intercultural competence. Not only are our classes more and more multicultural, but the workplace is also increasingly diverse. The Comenius University Faculty of Medicine in Bratislava provides medical education for more than 700 international students who comprise nearly one third of all medical students trained during the academic year 2018/2019.

However, there is also a lack of an agreed specification of the components and method of teaching of intercultural competence for both students and faculty. Students who spend all or part of their education in another country are expected to adapt to the norms of that country. Faculty often lacks the training and skills necessary to teach and foster intercultural competence in their increasingly diverse classes.

In medical education we have to keep in mind the impact on economy and competitiveness in regional performance. The new agenda in medical education is tolerance and confidence. In practice this means higher engagement in community service which can improve practical skills of medical students, encourage resilience and non-conformity to make students not only good doctors but also responsible citizens.

### **Comenius University Faculty of Medicine reflecting the global digitalization**

Our Medical Faculty at Comenius is monitoring closely the changes and cannot stay in the past. We need to move forward within the new circumstances.

There are many changes in the society including ones in health-care practice influencing our direction. They need to be considered also in addition to changes in the research and education field. For example, about 20 years ago, patients remained in the hospital long enough to enable students to witness the course of their illness and treatment. Students today are missing most aspects of patients' care because of the trend of one-day surgery and one-day hospitalization. There are not enough patients in the hospitals to accommodate the large number of medical students. Students need more intense contact with the patient and the diseases they meet in daily medical practice. There are few ways how to approach this change nowadays. We need to involve our medical students into community, include more outpatient clinics days into their sched-

ule. It will be helpful to aim preferably for primary care clinics to make the current trends in patient care available to observe, and at the same time to teach our students the skills they particularly need for outpatient care.

Teaching clinical reasoning and critical thinking early on, integrating theoretical, preclinical and clinical subjects, incorporating case-based learning into theoretical subjects and theory basis into clinical teaching, starting clinical exposure earlier and gradually increasing, can all help in increasing the clinical competence of our students. New active methods, including project-based learning, team-based learning, case-based learning can help with transition from passive knowledge into ability to apply it in the clinic. Sustainability of teaching may be enhanced with a cooperation between institutes, departments under Medical Education department, providing a platform for supporting teachers in all the departments and institutes in the education of our students.

A new elective subject was established for students to learn about principles of medical education, and to take part in teaching under the faculty guidance, and support them in joining the faculty at Comenius University Faculty of Medicine (CU FM) or other university after graduating. There is a need for quality teachers to face the abovementioned challenging circumstances. The same support of workshops and courses about teaching methods and forms may be helpful also for new teachers entering Comenius and teaching for the first time. Even these small changes may enhance the learning experience in our classrooms.

We need also to include new ways of teaching skills for acute care of patients. They too face many challenges. We have a constantly increasing student/patient ratio, stricter rules about patient safety, and fewer of our patients agree to participate in education process in clinics. There is a need for a new way to approach this issue. Simulation based medical education is an excellent tool to meet this need. It is a form of teaching and learning using simulated patients or/and simulated environments to facilitate learning.

Comenius University Faculty of Medicine leadership decided to face these challenges. The motivation and the decision to open the simulation centre was to improve the quality of medical education including communication skills, medical ethics, medical law principles from the very beginning of medical training. The motivation to innovate the medical curriculum compelled the Dean along with the Vice Deans, to visit the simulation laboratories at US universities. Their experience and the urge for change brought the decision to the table, and in 2013 the Simulation Centre at Comenius University Faculty of Medicine in Bratislava was officially opened and first teaching sessions started in winter semester of 2014/2015 with pilot program of the Physiology Institute. Medical simulation provides added value only with well-trained and enthusiastic educators and virtual patients with sophisticated designs. With the leadership's financial and administrative support, the new premises with the medical simulation mannequins were prepared for the changes to happen. Dr. Jan Vilcek, noble alumnus and the recipient of the title Doctor Honoris Causa of Comenius University was the chief instigator to build cooperation between Comenius University Faculty of Medicine and New York University School of Medicine. Since 2007, the staff on both sides of the

Atlantic Ocean have been working very intensively and diligently on systematic changes in the medical education curricula. The financial support from the Ministry of Education and Research in Slovakia – through a grant from the project Going Global for increasing quality of education - was awarded to CU and helped in the implementation of planned changes in medical education. New York University School of Medicine (NYU SoM) is the national leader in medical education adapted to the needs of future health care. Faculty from their New York Simulation Center (NYSIM) provided special training courses for CU FM faculty, who took part in preparing the first scenarios for students in simulation center. Course graduates helped establish and expand simulation teaching at the CU departments and institutes and served as trainers to their peer teachers, achieving sustainability in these innovations. Thanks to our effective cooperation with the leadership and teachers, the simulation centre today is not just enriching the subjects but also in the future will serve for the assessment of students' performance.

The first OSCEs - Objective Structured Clinical Exams in Slovakia, which were used in Physiology, Pediatrics and Internal Medicine, were possible with help and cooperation with NYU. OSCEs are very powerful tool to teach and assess knowledge and skills needed for clinical work. Also students need to do more than demonstrate the medical knowledge and skills prescribed for the qualification. They also require "soft skills" including communication skills, in combination with ethical principles and medical law implementation. However there was no standard way of evaluating and certifying soft skills which are important for medical team work and effective communication with patients, their relatives, and the hospital staff. OSCEs demonstrated new way to make this possible with excellent feedback from our students. It is a work in progress, but it is definitely the way to move forward. OSCEs are integral part of final evaluation in many universities and countries proving their role in assesment for necessary clinical skills. Another innovation from NYU was the creation of WISE-On-Call – a series of web-based modules created to enhance medical education. Students at CU FM are able to use WISE-OnCall as a complement to lectures, giving students the possibility to learn in their own pace and time and then discuss what they have learned with their teachers during tutorials.

What are the goals for the 21<sup>st</sup> century curriculum at Comenius University Faculty of Medicine? The incorporation of simulation into the curriculum has changed the students, but at the same time the teachers and the simulations are in a constant process of adjustments. The practice of medicine by our students is rapidly evolving thanks to changes of the education system. Implementing active forms of learning like team based learning, has met with positive student feedback. Many teachers were able to get trained in this new method. The introduction of standardized patients and Objective Structured Clinical Exams (OSCEs) at CU FM provide the basis for changes in education and knowledge assessment. Pioneering advances made in education at Comenius will improve current education. Constant re-education will also prepare us for the challenges ahead in the information age. Hand in hand with the campus renovations and the newly established additional centre for medical simulation, SIM-PED, at the National Institute of Childrens' diseases, the faculty will be able to expand innovative quality assessment.

Jan Amos Comenius, a notable historical personality, teacher, theologian and philosopher, after whom the Comenius University is named, considered the school as the manufacturer of humanity. Knowledge and skills are the most valued worldwide but they have to be closely linked with our passion and dedication, and sometimes sacrifice, to help those who feel helpless and hopelessly lost in their illness. And that mission can be helped by our simulation centre, teaching students an ethical and compassionate approach to patients and their relatives as well as to the hospital personnel.

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