

DEFINING THE NEXT GENERATION UNIVERSITY MODEL

*Tatyana S. Stanko*¹, *Elena P. Chernykhkova*^{2, 3}, *Oksana B. Anistratenko*⁴

¹Kazan National Research Technical University, Kazan, Russia,
e-mail: tanya.stanko@gmail.com

²University of Navarra, Pamplona, Spain,

³Ural Federal University, Ekaterinburg, Russia,
e-mail: echernyshko@alumni.unav.es

⁴Social Investment Foundation, Moscow, Russia,
e-mail; o.anistratenko@soc-invest.ru

Abstract. University education, and engineering education in particular, is currently going through the period of intensive change. A number of new universities have been established in recent years to fulfil modern educational model in STEM. Often such new universities are privately funded initiatives. Current research effort reports the finding of a recent study commissioned by a private foundation with a goal to establish a new engineering university in Europe.

The purpose of the study was to identify significant global trends in education and to develop recommendations for setting up a model for a next generation university capable of creating an environment sufficiently fertile for the development of an intellectual elite suitable to the modern world. Preference was given to the recommendations relevant to the Minimal Viable Product (MVP) concept.

The data for the study was collected between November 2017 and March 2018. Three qualitative research methods were utilized in the study: twenty semi structured in-depth interviews were conducted with international experts from academia, business, art and policymakers from EU, USA and Russia. In this paper we report on the fraction of the study related to the experts' perspective on local and global trends in higher education.

Expert interviews provided an opportunity to get acquainted with the respondents' opinions on three topics: first, to discuss economic and social processes that influence the education system and how the education system in general and higher educational institutions in particular respond to these processes; second, to understand what innovations are developing in modern universities and what new projects and models of activity within these the universities have been successful and why; third, to find out what the respondents think about launching a new, next generation university, what features they consider necessary for success and what key risks they see in this project.

The experts converged on several important trends in higher education: (a) globalization and increased competition as factors in spawning inequality, (b) an advanced university in the future – a center of intellectual power autonomous and independent from the state, (c) highly personalized educational plan, with an ability to combine completely different modules from STEM, art, history, real-life projects etc.; (d) return to the origin of liberal arts envisioning university as a bearer of the European humanistic tradition; (e) truly multidisciplinary education program in complex socio-technical systems with strong emphasis on data science; (f) distributed and cross-border campus and individual adaptive educational scenarios.

Experts agreed that in a world that is getting more and more complicated, university education should shape thinking in a broad sense, orient people towards the solution of global issues that humanity faces. Extensive basic knowledge in different disciplines should be combined naturally with a deep expertise in concrete subjects. A professional of the future should possess balanced knowledge and skills both in humanities and technical fields.

In the face of rapidly changing social and economic landscape in the world and education in general, it is important to stay tuned with global and local trends and redefine the approaches to education through one's life. We do not aim to determine the one and only possible and complete model of a university of the future, but rather prefer to demonstrate that there is no single approach, that will be able to address every challenge that the society is facing at the moment. We believe that modern world needs substantially more different educational models, more universities with fundamentally different agendas targeting variety of stakeholders in different time of their lives.

The findings of this study highlight global trends in higher education affecting most university models and STEM education as a whole.

Keywords: Modern university; trends in education; lifelong learning; on-line education

Introduction

The globalization of economic life requires successful universities to be international in terms of the composition of university professors, students, and governing bodies. To succeed in competition for resources and international students (a source of income and prestige), the university must build an international community (Carey, K., 2015), attract strong professors and experts from all over the world, and be the focus of international intellectual life on the territory of their country.

There are at least two approaches to achieve the goal of creating successful university well aligned with evolving global socio-economic environment

(www.engineeringchallenges.org): to modernise existing universities and to establish new green-field institution based on various concepts. In the last decade there is a pronounced trend on setting up new university models (Rosenbloom J., 2011, Crawley et al., 2013, Kondratiev et al., 2013, Minerva project).

Objectives / Purpose of the study

The purpose of the study was to identify significant global trends in education and to develop recommendations for setting up a model for a next generation university capable of creating an environment sufficiently fertile for the development of an intellectual elite suitable to the modern world. Preference was given to the recommendations relevant to the Minimal Viable Product (MVP) concept. The study has been commissioned by a private foundation with a final goal to establish a new private university in Europe.

Here we report the results related to the expert interviews on general HEIs' development trends only.

Methodology

The research method included a series of expert interviews. The expert poll was held in the format of in-depth expert interviews - detailed structured conversations with respondents. During the study, 20 experts representing academia, business, art and policymakers from Sweden, Italy, Netherlands, France, Ireland, Spain, Belgium, Singapore, Israel, USA and Russia

Expert interviews provided an opportunity to get acquainted with the respondents' opinions on three topics: first, to discuss economic and social processes that influence the education system and how the education system in general and higher educational institutions in particular respond to these processes; second, to understand what innovations are developing in modern universities and what new projects and models of activity within these the universities have been successful and why; third, to find out what the respondents think about launching a new, next generation university, what features they consider necessary for success and what key risks they see in this project.

Results

Globalization and increased competition as factors in spawning inequality

According to experts, the globalization of the economy, the massification of higher education and the growing mobility of students and professors all over the world have led to fiercer competition for talent and resources, increases in the level of necessary investment, and, as a result, have forced universities to compete with large corporations for researchers. This in turn has led, inevitably, to greater separation among universities. In the future, it is to be imagined that only two entities will survive: the powerful, stable and

rich, and those which are small, flexible, and exceptionally resourceful.

«I think that there is a stratification dilemma here, as in the whole world. What will happen — on the one hand, large universities will still exist — elite universities that will respond to certain needs, either intellectual or practical. But here the role of the middle ones, as if becoming the case all over the world (in other spheres), disappears; the middle class - it goes away everywhere. The same thing happens with universities. [...] Polarization and stratification, this is a slightly different topic... Big and small will remain, and the middle-sized ones will go away.»

«Differentiation is an integral part of the evolution that is taking place now. In this sense, there won't be a typical successful university. You should generally refuse to think in this paradigm. There won't be a universal model.»

An advanced university in the future as autonomous and independent from the state centre of intellectual power

Independence from the state and involvement in the network is a promising trend is to be regarded as essential. Many experts noted that such autonomy represents a vital criterion for the success of the university in the future. Therefore, the University of the future must be able to stand on its own feet as an independent center of intellectual power (although at the moment a great number of strong universities directly depend on the state and its funding, and therefore have no choice but to tolerate its intervention at the management level). In order to ensure a quick start and optimal positioning, it is crucial for any newly-established university which shares a mission that is discussed in this paper to join, at an early stage, the necessary networks and form partner programs with other, preferably well established and even famous, universities. They must also form strategic alliances with employers that are household names to the public (UN, EU, large companies), as well as establishing cooperation and integration with international organizations such as UNICEF, Habitat, UNESCO.

«The university is not merely an institution for training, it is not only a research institute, there should be a broader way of thinking, augmented by the capacity to entertain and reflect on ideas from any scale, absolutely any scale - it is a very big ambition, and, unfortunately, this kind of thinking is intercepted by corporations, governments, many of whom deny that universities should have ideas, so it is already a struggle for intellectual power»

«It's really important to realize that the world around us is changing, and universities should either lead that change or accept that they are going to be just some kind of service organization»

«Universities should be autonomous from the state, included in the state, but

be independent corporations, that is, the same as they were in the 12th- 13th centuries. History has made a circle of almost 1000 years»

Personalised education

Almost all experts expressed the idea that personalization of education is the leading trend in the development of higher education and will become an important criterion for the success of any educational project in the future. The expert opinion correlates well with Gallup Research Group (Gallup Purdue Index Study, 2015), where the main criterion for the success of higher education from the standpoint of graduates is the level of attention paid by professors to the students as individuals.

«The Gallup Group has found out that there're two questions that you ask Alumni that are highly addictive of well-being later in life. The first question is: when you were a student, did you live after anyone who cared about you as a person, who inspired your learning and who nurtured your dreams, yes or no? And the second question was: when you were a student, did you have an opportunity to apply what you've learnt in real world context, while you still were a student? If you answered "yes" and "yes", it turns out your well-being as measured by the Gallop well-being index, is a factor of two higher than average»

«The changes in the systems of education and training in the next 15-20 years will be quite dramatic. The diploma will be «assembled» like Lego: a person will be able to receive individual elements of training, moving from one point of the world to another, alternating education with the work cycles, having the opportunity to build on competences from modules»

Return to the origins of liberal arts

Experts agreed that in a world that is getting more and more complicated, university education should shape thinking in a broad sense, orient people towards the solution of global issues that humanity faces. Extensive basic knowledge in different disciplines should be combined naturally with a deep expertise in concrete subjects. A professional of the future should possess balanced knowledge and skills both in humanities and technical fields.

«I believe that in our time it is very important to reaffirm the traditional goal - that the university is the bearer of the European humanistic tradition, to recognize the importance of the breadth of education along with the specialization and focus on the global intellectual progress of society»

«The crisis of higher education deepens, it is too long and expensive and does not give what is needed. Education again should become broad and profound, as in ancient Greece»

«To continue teaching as actively as before in the fields where a human being can be replaced completely or for the most part by a computer, is senseless enough. We cannot fight with artificial intelligence and its

computing power, it will be an ineffective investment of our energy, whereas it will, by contrast, be more effective to invest in areas where machines cannot replace us yet. That sphere is really more connected with liberal arts, with various so skills and patterns of academic endeavor, and this is more connected with the humanitarian part»

Advanced technologies for instruction and the composition of the program

Experts suggested introducing a number of advanced teaching methods: combination of on-line courses with working in a classroom with a mentorship from of a professor, mixed groups of young students and students who already have work experience, partnership undergraduate programs with other universities, ideally attracting several mentors to work on a project/diploma.

«So I can see a model where you base education on online type for really top courses. And tell students that what we do is we check all the courses worldwide for which ones are the best in their areas, that's one thing the University can do like a quality control. Then you come at the afternoon at 3 o'clock will have people available to help you to work through problems»

«Clearly distance education combined with live classroom, seems to be very effective»

«When I was a young student when I came to MIT first in my class they had students like myself who didn't know very much other than the facts and then you have these industry guys who are maybe 40 years old or something, who had lot of experience and they put that together into mixed group of the older and younger students and it became really interesting»

Distributed and cross-border campus

Experts recommend - for launching international programs - using the distributed campus model at the beginning of the project, where there is a physical building downtown with all the advantages of city life, and in addition a country pavilion, then possibly campuses in other cities of the world (thus a cross-border campus). Experts recommend not buying/constructing a campus, but renting facilities. In a city where the main campus is located, there should be a high concentration of intellectual capital and a vibrant economy that provides job opportunities for graduates.

Discussion

In the face of rapidly changing social and economic landscape in the world and education in general, it is important to stay tuned with global and local trends and redefine the approaches to education through one's life. We do not aim to determine the one and only possible and complete model of a university of the future, but rather prefer to demonstrate that there is no single approach, that will be able to address every challenge that the society is facing at the moment. We believe that modern world needs substantially

more different educational models, more universities with fundamentally different agendas targeting variety of stakeholders in different time of their lives.

References

- Carey, K., 2015. 'Are We about to See the End of Universities as We Know Them?', World Economic Forum, April 29, 2015. URL: <https://www.weforum.org/agenda/2015/04/are-we-about-to-see-the-end-of-universities-as-we-know-them/> [Accessed March 7 2019].
- Crawley, E.F., Edstroem, K., Stanko, T., 2013. Educating Engineers for Research-based Innovation – Creating the learning outcomes. In *Proceedings of the 9th International CDIO Conference*, Massachusetts Institute of Technology and Harvard University School of Engineering and Applied Sciences, Cambridge, Massachusetts, June 9 – 13, 2013. Pp. 3-13.
- Kondratiev, D., Tormasov, A., Stanko, T., Jones, R., Taran, G. 2013. Innopolis University – a new IT resource for Russia. In *The proceedings of the International Conference on Interactive Collaborative Learning (ICL)*, Kazan, Russia, September 25-27, 2013. Kazan: ANO “University INNOPOLIS”, pp. 128-136.
- Rosenbloom, J., 2011. Reinventing the Way We Teach Engineers. URL: <https://www.inc.com/articles/201104/olin-school-of-engineering-richard-miller-interview.html> [Accessed March 7 2019].
- Minerva Project. URL: www.minerva.kgi.edu [Accessed March 7 2019].
- Gallup Purdue Index Study, 2015. URL: <http://www.gallup.com/services/185924/gallup-purdue-index-2015-report.aspx> [Accessed March 7 2019].