

EXTENSION AND CONTINUING LEARNING PROGRAMS AS A RESPONSE TO DEMANDS OF A DYNAMIC INDUSTRIAL PROGRESS

Boško Čelić¹, Marija Delić², Jovana Dedeić³

¹California State University San Marcos, Department of Mathematics, San Marcos, CA, USA

¹University of Maryland Global Campus, Department of Mathematics and Statistics, Adelphi, MD, USA

^{2,3}Univerzitet u Novom Sadu, Fakultet tehničkih nauka, Novi Sad, Serbia

¹bcelic@csusm.edu, ²marijadelic@uns.ac.rs, ³radenovicj@uns.ac.rs

Abstract: In the time of significant technological development and progress, digitalization of many industrial processes and daily necessary actions, the whole society is faced with new ways of communication and execution of daily activities. Accordingly, the needs of the market are changing, in terms of changing priority areas and levels of education, adapting to rapid technological change and different types of skills that employees should possess. As one of the basic factors in the process of forming future employees and the bearer of further progress of the society, university education is facing several problems that should be considered. Due to the large technological changes that happen every day, one of the basic problems is that a significant part of future jobs will be difficult to predict, except of the fact that they will require a very different range of skills than most graduates. The reality in today's digital world is that we need to teach each generation how to quickly learn, unlearn and relearn again, to have the ability to adapt to different needs and requirements of the market but not to allow it to fully manage them. University education has a very important role in forming future generations of workers who can transform the future of work, instead of being transformed by it. This paper will analyze several important problems facing the educational process in the era of industrial development. Additionally, it will present proposals for their solutions viewed from the aspect of university programs in Serbia and America.

Key Words: university education, modern industry, challenges and changes in higher education, extension program, continued learning

1. INTRODUCTION

Higher education has been thrown into a world of flux, insecurity, and uncertainty as a result of globalization [1]. Globalization is characterized as the reality formed by a more interconnected global economy, new information and communications technologies, the establishment of a worldwide knowledge network, and other forces outside higher education institutions' control [4,5]. Higher education institutions must not only play a role in cultural and social development but also play a vital role in the national economy in today's highly competitive and dynamically changing global market [2]. As a result, higher education institutions have evolved into business-like organizations with accountability and quality assurance performance indicators. Universities all over the world are tasked with promoting the employability of their graduates, which necessitates the development of abilities that are applicable to professional experience. In this regard, where graduates work and what they do at work are of particular importance [3].

According to research advanced education will be required for 80 percent of new jobs created in the global knowledge economy [7]. Colleges and universities, are consciously rethinking their institutional missions to include innovation and entrepreneurship [8]. The reality in today's digital world is that we need to teach each generation how to quickly learn, unlearn and relearn again, to have the ability to adapt to different needs and requirements of the market but not to allow it to fully manage them. Therefore, students must be trained and prepared for lifelong learning. University education has a very important role in forming future generations of workers who can transform the future of work, instead of being transformed by it.

Job creation is at an all-time high in the industrialized world. However, there is a big gap between what consumers want and what is actually accessible. For example, the phenomenon was observed that the unemployment rate in the United States is around 3,6% but that there is still a huge number of vacancies [9]. The question naturally arises: What are the reasons for this development of the labor market? First, "overqualified" graduates are not interested to some of those jobs. Second, some jobs require a different skillset than what job seekers offer. Third, the number of college graduates continues to rise, but the problem is there is widespread skepticism about how university degrees translate to the workplace. An increasing percentage of employers voicing worries about graduates' job preparedness and ability to provide instant value [9].

Higher education institutions must change if they want to remain sustainable. In order to survive many higher education institutions have to adjust established educational paradigms and create a new model of global involvement. The university is currently a hybrid of physical and online education. As a result, universities are increasingly relying

on technology to establish and sustain contact with a broad and changing student body seeking anywhere, anytime learning [6]. Due to the global COVID-19 pandemic, the educational practice has been shifted from the traditional classroom environment to online lessons, i.e., from personal to virtual and from seminars to webinars. Previously, distance learning and online courses were commonly perceived as a part of non-formal education. These days, it seems that distance learning would gradually replace the classical educational system if the circumstances continue to develop in the same direction [10].

The need and desire for higher education is growing, but it is debatable what is the possibility of sustainability of higher education in this form. Namely, due to major changes in industrialization, accelerated development of technology, the higher education was forced to introduce changes and adjust the way of teaching, as well as the form of active courses to the needs of the market. Also, an important step will be inclusion of different types of internships between university and industry in the final years of study, which could help the student to apply acquired theoretical knowledge. Enabling the formation of shorter courses that would have practical application in the market, or which can be used for the purpose of additional education of already employed workers who are currently adapting to a new project is a way for the university to include the needs of the market in the development of education and new directions of teaching.

Traditional universities have been historical producers of knowledge in the form of human resources, research and various scholarships. These institutions are now challenged to take advantage of society's growing need for lifelong learning and improvement.

As students complete their formal college education, many of them enter the job market and try to find the position that meets their skills and qualifications in the best possible way. Potential problems that might arise here can be observed from the two points of view:

- (1) From an employer's standpoint;
- (2) From a job candidate's standpoint.

Employers predominantly require “hands on” skills and experience from their candidates and they expect students to know how to apply that knowledge to a certain position while the level of education and attained academic title are not that important. Job candidates share a similar interest with their future employees in terms of finding the best possible fit, but they put much more weight on their academic knowledge and skills obtained during their time on campus. The career development of every college graduate depends mostly on the first job position they manage to find which is in many cases not directly related to their major of study. This can be considered as a negative trend given the amount of resources that candidates invest in their tuition, learning materials, and costs of living in order to finish their higher education and achieve an academic title in a certain major. This problem even grows on a larger scale when we take the volatility of the job market fueled by the industrial progress. Despite the fact that higher education in the US is getting very expensive and the tuition costs have already skyrocketed nationwide, students are not getting a proportional level of applicable knowledge that they can materialize in a dynamic job market. Serbia is recognized to have bigger social mobility and its higher education is accessible to a broader socio-economic layer, but there is also a broadening gap between the programs offered by universities and industrial progress demand that needs to be bridged in the future. In the continuation of this paper, we will discuss two additional models of learning that might help in the adjustment between the higher education programs and the demands of a dynamic job market.

2. EXTENSION AND CONTINUED LEARNING PROGRAMS

An extension program is a separate department within a college or a university that provides classes to local residents interested in gaining new knowledge, skills and abilities. The major difference between these programs and a formal university education lies in the fact that individuals enrolled in the extension programs usually take classes only to improve their knowledge in a subject while the completion of their course activities will not earn a credit.

Continuing education programs are similar but not the same as extension programs, and these two are very often misconceptionally blended into the same category. Continuing education is designed for students and professionals who are pursuing additional certifications or licenses, while extension programs don't typically furnish any kind of documentation to their trainees. Some professions from the health and IT field require employees to take continuing education courses in order to stay ongoing with new technologies, methods and practices.

Unlike continuing education that targets trainees with a certain background, skill arsenal and experiences, the extension program is usually inclined towards local residents who can take part in it regardless of their age and education level. Likewise, extension programs are designed to be the link between the demand from local industries for skilled professionals and supply of such manpower from local communities while continuing education aims to teach skills that both advance their general knowledge and keep them up-to-date on new trends regarding their career

field. Many companies motivate their employees to take these types of training by providing them higher wages and salaries, promotions and/or better benefits [11].

Driven by the dynamics and volatility of a modern job market, both extended and continuing education span over resources beyond the conventional university setting. To accommodate the educational and professional development of today's workforce, many universities and colleges offer a variety of program formats through short-term educational opportunities, as well as customized solutions provided on weekends, evenings or online.

The content, length and organization of these programs depend on many factors that originate from the university/college culture and the field of the course study. Although extension and continued learning coursework can vary from a wide spectrum of formats (from classroom to lab based, from workshops to project oriented activities), each of them should have a course overview that is communicated to learners though:

- *Course Description*: A brief summary of the significant learning experiences for the course. It explains the main focus of the course, its applications, methodology, course requirements, textbooks and other materials.
- *Course Topics and Learning Outcomes*: Describes main points of students' achievements after the completion of the course.
- *Learning Activities and Grading Criteria*: Comprise:
 - *Class Discussions/Discussion Boards*: Variety of forums and open-minded exchange of ideas among a teacher and students.
 - *Peer-to-Peer Work*: Learning strategy where students, teamed in pairs or small groups, interact and teach/learn from each other.
 - *Written Assignments (reports, papers and essays)*: Analytical literary form that observe a particular subject from a critical standpoint. It can be written in formal or informal language.
 - *Case Study Analysis*: Intensive and systematic study and investigation about a person, a group of people, organization, event or a natural phenomenon aimed to seek patterns and causes of behavior in order to recommend a course of action for that particular case or situation.
 - *Student Projects*: Many extension and continued learning programs are project based. They involve students in individual work on a certain topic or set of topics over an extended period of time (from a week up to a semester) and engage them in solving a complex real-world problem or answering challenging questions.
 - *Readings/Handouts*: These are frequently used in flipped-classroom settings where students read the information provided by a course instructor, learn about new topics independently and then present their understanding to the class.
 - *Textbook/Workbook Exercises*
 - *Other*

Many universities in the US have their extension and continued learning programs. The most popular are UC system extensions such as: UC Berkeley, UD Davis, UC Los Angeles, UC San Diego. There are also Harvard extension programs, Carnegie Mellon certificate programs and many others. They offer certificates in Business, Education, Engineering, Data Analysis, Mathematics, and Healthcare.

3. CONCLUSION

The future is turned to companies and people who approach education in parallel with business obligations. Therefore, it is necessary to consider the reconstruction of existing models of education. It is very certain that a diploma will not be a measure of success, but it will be an individual's ability to learn quickly and adapt to change. Benefits of extension and continued learning programs can be found in the fact that they provide students and professionals with advancement in specific set of skills, in project oriented learning that imitate working environment, team based work with the members of similar abilities and interest, experienced instructors that come directly from industry, and valuable certificates respected by employers in the field. However, over the years many of these programs started to look like a set of regular university courses where the knowledge delivered to students has no real value in the job market. In other words, they continued to grow back with the academic knowledge base because they originally used university resources and over time they started to diverge from their industry related purpose. Hence, in order to run a successful extension and continued learning program, a win-win situation for students and industry is hidden in a perfect balance between job market needs and the skills, experiences and best practices delivered through functional university resources. Only this way, extension and continued learning programs will fully serve their purpose, which is to be the best possible bridge between educated but inexperienced professionals and growing industry needs for resourceful planners and problem solvers.

4. BIBLIOGRAPHY

- [1] Douglass, J. A., King, C. J., & Feller, I. (2009). *Globalization's muse: Universities and higher education systems in a changing world*. Berkeley, CA: Berkeley Public Policy Press.
- [2] J. Abbas, M. Sagsan, *Identification of key employability attributes and evaluation of university graduates' performance: Instrument development and validation Higher Education Skills and Work-based Learning*, 10 (3) (2019), pp. 449-466, 10.1108/HESWBL-06-2019-0075.
- [3] J.C. Brachem, E.M.P. Braun, *Job-related requirements and competences of educational science graduates Journal of Further and Higher Education*, 42 (2) (2018), pp. 166-176.
- [4] Altbach, P. (2015). *Knowledge and education as international commodities. International Higher Education*, (28), 2-5. <https://doi.org/10.6017/ihe.2002.28.6657>
- [5] Mishra, R. (2013). *Globalisation and higher education: Threat or opportunity? International Journal of Humanities & Social Sciences*, 1(1), 39-47.
- [6] Mense, Evan & Lemoine, Pamela & Garretson, Christopher & Richardson, Michael. (2018). *The Development of Global Higher Education in a World of Transformation. Journal of Education and Development*. 2. 47. 10.20849/jed.v2i3.529.
- [7] Kauppinen, I. (2015). *Towards a theory of transnational academic capitalism. British Journal of Sociology of Education*, 36(2), 336-53. <https://doi.org/10.1080/01425692.2013.823833>.
- [8] Balán, J. (2015). *The crisis of the public mission in higher education. International Higher Education*, (80), 4-5. <https://doi.org/10.6017/ihe.2015.80.6130>.
- [9] Internet page: <https://hbr.org/2019/11/6-reasons-why-higher-education-needs-to-be-disrupted>.
- [10] B. Čelić and J. Dedeić. *Synchronous and asynchronous learning in online education, XXVII Skup Trendovi razvoja: "On-line nastava na univerzitetima"*, Srbija, 2021.
- [11] Internet page: Heather Fishel, Campus Explorer: What's an Extension Program? <https://www.campusexplorer.com/college-advice-tips/5B1F1DAF/What-s-an-Extension-Program/>

Acknowledgments: This work was supported by the Department of Fundamentals Sciences, Faculty of Technical Sciences entitled "APPLICATION OF FUNDAMENTAL DISCIPLINES IN TECHNICAL AND INFORMATION SCIENCES (PRIMENA OPŠTIH DISCIPLINA U TEHNIČKIM I INFORMATIČKIM NAUKAMA)".