Education of Teachers at Higher Education towards Changing Education Expectations

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***Abstract* - In the context of current technological development, its impact on the life of mankind and dramatic changes in society during the COVID-19 pandemic, the importance and its appropriate use in the education process has just arisen. The changes in education styles had to take place at all levels of the education system, including Higher education. Returning to the face-to-face form of education as it was before the pandemic is not possible anymore. Both students and teachers have discovered the wide options of technology used to further improve the educational process. However, in addition to the development of skills with the use of technology, it is necessary to develop other pedagogical skills and personal qualities of teachers, so that they can prepare their students for the continuously changing labor market. One of the projects that focuses on the development of teachers in all aspects of the educational process is "Holistic Education and Training of University teachers in the field of Economics". In this paper, the project is briefly described. Furthermore, the expected and already obtained outcomes and benefits for the entire pedagogical community and the educational process are showcased.**

Keywords - education platform, education tools, innovative teaching methods, teachers' skills development

I. INTRODUCTION

The 4th Industrial Revolution shifted the society and professional world into a more technology-supported space. And in the world of education, educators must remain abreast of these changes. The teacher's role in the education process never be the same anymore – he lost his/her role as a living "encyclopedia" that provide their student with important information. Nowadays the best teachers can help students to take ownership of their learning. That is why he/she needs to understand and be able to implement new technologies providing a variety of media and learning-support tools, that help students to receive education via the Internet, to increase their attention (for example using videos, visualization, storytelling, etc.) and approaches build the soft-skills and life-long learning abilities of the students.

Due to the emergence of advanced technologies and internationalization and globalization trends, higher education continuously changes [1]. Knowledge society, students' learning preferences and technological development lead to the process of curricula updating, and pedagogic methods innovation [2]. A lot of attention is paid especially to researching how to enhance students' learning outcomes in a more scalable, flexible environment secured by technology. Digital innovation provides wide-world access to educational opportunities and advances inclusion, enhances the relevance and quality of learning, builds ICT-enhanced lifelong learning pathways, strengthens education and learning management systems, and monitors learning processes. What is slightly omitted is the role of technological infrastructure in addressing individual and organizational advancement [3], [4].

The implementation of new technologies goes together with education transformation for almost decades, but the COVID-19 pandemic accelerated this process. Rich Henderson, Director of Global Education Solutions at Lenovo also confirmed the given situation by his *"Digital transformation has been underway in schools worldwide for the last several years. But it's been a slow transition. As a society, we had not yet crossed that threshold of full tech integration into our in-person instruction. When COVID-19 happened, it forced the digital transition on schools and teachers in a matter of weeks.*"

The available technologies like massive online courses, interactive whiteboards, virtual classrooms, augmented or virtual reality, and 3D printing support different education methods, like blended learning, etc. This transformation does not cover just the way of delivering education but promotes innovations and outside-the-box thinking [5].

However, as George Couros [6] mentions, in addition to the development of skills with the use of technology, it is necessary to develop other pedagogical skills and personal qualities of teachers, so that they can prepare their students for the continuously changing labor market and support the development of those skills that will enable them, not only the first successful entry to the labor market but also react dynamically to changes that are still taking place thanks to the development of society. One of the projects that focuses on the development of teachers in all aspects of the educational process is "Holistic Education and Training of University teachers in the field

of Economics". In the contribution, we will briefly present, the project itself, the expected and already obtained outcomes and benefits for the entire pedagogical community and the educational process. Finally, we will identify challenges to further developing higher education in Slovakia.

II. EDUCATION TRANSFORMATION

Education transformation is a wide topic, especially thanks to rapidly developing and available technologies. Today we have a lot of different technical tools and technology-based approaches, that could help teachers create more creative and experiencing learning environments for the students. Among the trendiest educational technologies, it is possible to mention virtual and augmented reality [7], [8], gamification [9], [10] and cloud technology [11], [12]. The advantages that teachers can get are:

- *Better interactive experience* – by implementing new technologies the education process becomes more dynamic by using various tools like videos, simulations digital books, etc. The learning can benefit from the deeper interest of the student followed by a higher level of his activity during the learning [13].
- *Enhanced retention of knowledge* – because of students' enhanced activity and interest in learning while he is using the technology, the retention of knowledge increases too [14], [15].
- *Support of every student's own pace of learning* – by using different tools and approaches the teacher can stimulate faster but also slower students to achieve the same educational goals [16].
- *Supported collaboration* – thanks to cloud solutions today students and teachers are now not limited to a classroom, but they can create learning groups and co-work on the activities through the school or wider space. Cooperative learning methods are tools that help to develop the hard and soft skills of the learners more effectively than in a traditional classroom [16], [17].

As stated in [18] among the main trends in education is soft skills training. The report of the World Economic Forum [19] represented the main technologies as advanced robotics, autonomous transport, artificial intelligence and machine learning, advanced materials, biotechnology, and genomics. These technologies change our lives dramatically and result in the disappearance of today's jobs and grow or create jobs that are not common yet. That is why the future workforce, our present and future students, need to be able to dynamically align its skillset to keep pace. The OECD [20] described that besides essential cognitive skills, metacognitive, social, and emotional skills become essential too. Already in 2013 Autor and Price [21] presented changes in the workplace. The Forbes [22] in 2022 ranked among the top 10 in-demand skills for the next 10 years skills Digital Literacy, Data Literacy, Critical Thinking, Emotional Intelligence, Creativity, Collaboration, Flexibility, Leadership Skills, Time Management and finally Curiosity and Continuous Learning. Among the important skills in the workplace for the future are critical thinking, problem-solving, people management, creativity, the ability to make hard decisions and leadership. Skills such as active listening, collaboration, and presenting ideas are highly valued in the modern workplace and increase the competitiveness of the person in the business environment [23]. While in the year 2000, the importance of soft skills was presented in 53% of job position offers, in 2015 it presented already 59% and it tends to reach almost 63% in 2030 (Fig. 1).

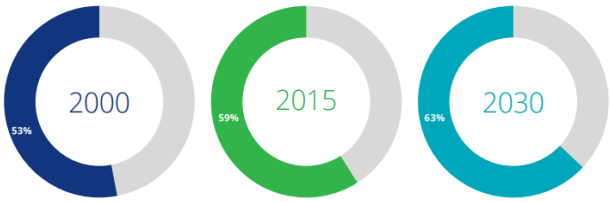

Figure 1. Soft skills intensive employment (% from all occupations); Source: [24]

The importance of soft skills doesn't decrease during the entire working life of a person; it does not matter if he is a graduate or a person who has been working for a long time. The changes in the workplace and society, evoke a huge need for education transformation. Available different technical tools enable change in the role of the teacher. Teachers are more facilitators now. Their job is to help students understand how to learn (and not in school while earning the degree but life-long), and how to uncover and understand the information they find.

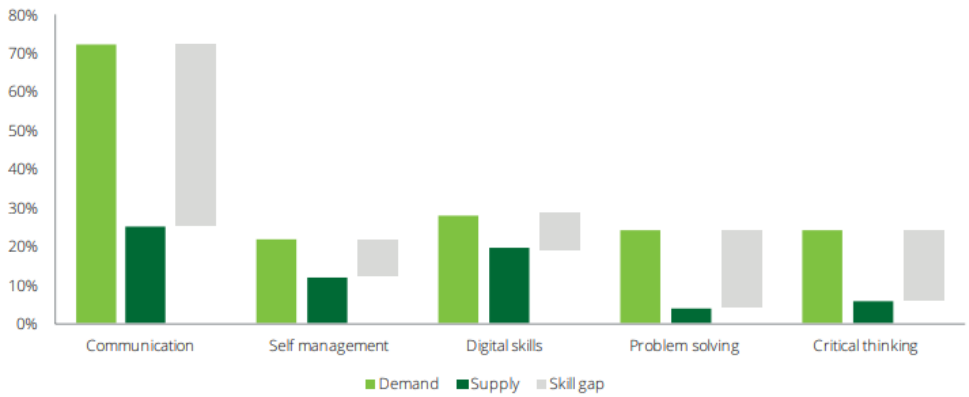

Figure 2.The soft skills gap; Source: [24]

Despite the fact, that there is a known need for more activities including the training of soft skills within the education process there is still an evident gap between the demand and supplied skills of the school graduates (Fig. 2).

Research by Majit et. al [25] identified that soft skills are considered important not only by employers but also by students. However, they found differences also in specific soft skills between these two groups. While students consider as important positive attitude, oral communication, self-motivation and self-direction, and problem-solving, employers put more emphasis on a skill like problem-solving (a skill that helps determine the source of a problem and find an effective solution. This skill at the same time includes also active listening, analysis, research, creativity, etc.), critical thinking (the purposeful, reasoned and goal-directed thinking involved in solving problems, formulating inferences, making decisions, etc.), effective communication (special kind of communication – communication in a clear, effective and efficient way), collaboration (one of the top employers' skills, that enables an employer to work well with others), and teamwork skills (qualities and abilities that allow an employer to work with others during conversations, projects, meetings or other collaborations) [26], [27]. The survey also shows that employers feel insufficient soft skills on the part of graduates and suggest the direct integration of soft skills development into the curriculum at all levels of education [28], [29]. The way how it will be done is important because students are fully aware of the importance of soft skills when entering the labor market and also in further career growth, but unfortunately, they do not make special efforts to acquire and develop these skills [30], [31]. Some authors realized that academic institutions are concerned more with hard skills development [32], [33], [34], but other ones present the possibilities of how to include this topic in education [30], [35], [36]. There are different ways how to solve this problem, i.e. to offer credit or non-credit dedicated modules for developing soft skills or to encourage teachers to include these skills in their courses' syllabi and provide an opportunity to practice soft skills in a given situation (for example by employing the group projects into education process).

The above-mentioned facts lead us to design the project "Holistic Education and Training of University Teachers in the Field of Economics", which will be shortly described following.

III. Project "Holistic Education and Training of University teachers in the Field of Economics"

Empirical studies have confirmed the critical impact of human capital on the development of innovation [37]. Analyses of the relationship between the innovation ecosystem and human capital are taking place at several levels of intellectual capital, e.g. individual, company, industry, region and/or country [38]. The formal education system has created an environment to prepare human capital that should be able to generate innovation in the labor market. Based on this knowledge the project "*Holistic Education and Training of University Teachers in the Field of Economics*" is oriented on the research of training needs and development of university teachers. The main objective of the project is to develop and evaluate an educational platform for university teachers, and lecturers. It has been focused on the research results: qualitative and quantitative research applied between university teachers and students.

During the first year of the project, the participants attended a few workshops about

- how the collaboration, creativity and idea exchange could help better to understand the end-user needs,
- learning design, i.e. how to design the training plans activities according to the needs of the end-users and eliminate areas of danger,
- education gamification principles, when and how it is possible to include it in the education process at HE.

However, to target the education of our teachers more precisely in the context of introducing innovation into education and better flexibility of the provided education regarding the development of the labor market, we decided to map the needs of our teachers in detail. The research question focuses on what the main requirements and needs are for the development of the pedagogical skills of teachers at the faculty. The questionnaire was prepared based on the previous research studies and the Teacher Questionnaire used by OECD (OECD Teaching and Learning International Survey – TALIS). The adapted questionnaire used in this study was based on the competence model: science and research competencies, teaching and learning, intra-personal qualities (self-esteem, self-confidence, coping with stressful situations, etc.), inter-personal (presentation skills, effective communication, social perception, etc.), motivational and technological (innovation in the teaching process) [39], [40], [41], [42].

In this article, the results of the questionnaire survey will be presented. The survey was carried out at the Faculty of Economics, Technical University in Košice in the online questionnaire in the academic year 2021/2022. The questionnaire was divided into a few parts: the first part of the questionnaire was consisting of identification questions. In the second part of the questionnaire were questions about personal development. The third part of the questionnaire focused on pedagogical development, and the next part was on the scientific research development of teachers. The last part of this questionnaire was devoted to the self-evaluation of the teaching process in terms of innovative learning methods. Based on the results from pilot testing on a sample of teachers from the Faculty of Economics in the year 2021, the final version of the questionnaire was prepared and implemented in the year 2022. The questionnaire contained 8 identification questions, 7 open-ended questions and 8 multiple choice or objective questions. The study was designed as a descriptive and cross-sectional study of the current state of the project mentioned above [41].

The respondents of this survey were teachers on the faculty. All teachers (61 faculty academic staff) were invited via e-mail two times during the period (from May to July 2022). A total of 28 teachers (23 teachers and 5

TABLE I. TYPE OF NEEDS IN PEDAGOGICAL DEVELOPMENT (%) – PART A

Level	Learning Design	Forms of student evaluation	Design Thinking	Team learning	Peer learning	Problem-solving method
1	25	17.9	17.9	17.9	21.4	32.1
2	42.9	42.9	50	50	32.1	32.1
3	10.7	17.9	3.6	3.6	10.7	7.1
4	7.1	7.1	3.6	14.3	21.4	10.7
5	7.1	10.7	14.3	10.7	10.7	10.7
I do not know	7.1	3.6	10.7	3.6	3.6	7.1

Source: Own Contribution

TABLE II. TYPE OF NEEDS IN PEDAGOGICAL DEVELOPMENT (%) – PART B

Level	Flipped classroom	Project-based teaching	Blended learning	Language skills	Development of digital skills
1	14.3	25	17.9	39.3	28.6
2	39.3	28.6	28.6	35.7	39.3
3	14.3	7.1	14.3	10.7	7.1
4	10.7	14.3	7.1	3.6	14.3
5	14,3	14,3	14.3	10.7	10.7
I do not know	7.1	10,7	17,9		0

Source: Own Contribution

PhD. students) participated in the online survey, 12 respondents were male (42,9%) and 16 of them (57,1%) were female in different occupations (Fig. 3).

Only some of the most interesting results will be presented in this article. Respondents were asked to indicate their agreements with their needs for personal development, pedagogical development, or science and research development on the five points scale: 1 = strongly agree; 2 = agree; 3 = Neither agree nor disagree; 4 = disagree; 5 = strongly disagree; I do not know.

According to the results of the survey (table I and II), the most suitable forms for participants' pedagogical development are courses to improve language skills (75% of respondents), digital skills (67,9%), learning design (67,9%), design thinking (67,9%) and team learning (67,9%). The academic staff would like to be educated in the research methods (85,7% of respondents would like to improve their knowledge of quantitative research and qualitative research) and would like to improve their skills with project writing (82,2%) and project and financial management (71,4%). Based on the findings from the questionnaire, the respondents in the age group 23-35 years old would like especially to improve their language skills (28,57% of all respondents) and digital skills (25%); in the age group 36-45 years would like especially to improve design thinking (28,57%) and team learning, problem-solving, digital skills and language skills (25%); and respondents in the age group 46-60 years would like especially improve team learning (21,43%) and language skills (21,42%).

The other question was about the methods or forms of personal development (training type). The most of academic staff indicated that they preferred to be educated through online webinars (71,4% of respondents), workshops (71,4% of respondents), courses to improve qualifications (67,9% of respondents), reading professional books (64,3%) and non-formal conversations with other university teachers about how to innovate teaching and learning process for students (peer sharing – 32,1%). 60.7% of respondents indicated that summer school is the least suitable method to improve their personal development. 60,7% of respondents felt that effective communication (active listening, development of personal characteristics, etc.) was another field of training for personal development. There were identified other fields for personal development: creative problem-solving methods (57,1%), self-motivation and self-management (57,1%), and coping strategies for stressful situations. For respondents, some of the following forms were not interesting for personal development: training in meeting facilitation (35, %) and emotional intelligence and self-awareness (35,7%).

IV. CHALLENGES FOR THE FUTURE HE AT THE FACULTY OF ECONOMICS

In the near history, the higher education curricula universities were more concerned with enriching the hard skills of their attendants. But, in connection with workplace requirements and the gap between the skills achieved by the students (as future employees) and the expectation of the companies, the higher education institution needs to undergo a transformation in a set of educational objectives to get more attention to soft skills development of the students. As is presented in Figure 3, the different kinds of jobs were replaced by computers (i.e. routine work such as calculating, typing, and production tasks), while the demand for non-routine interpersonal and analytical skills increased dramatically [20], [21], [43].

Including the abilities of self-regulation of learning, creativity, critical thinking, and other soft skills in higher education curricula is a challenge in itself [44].

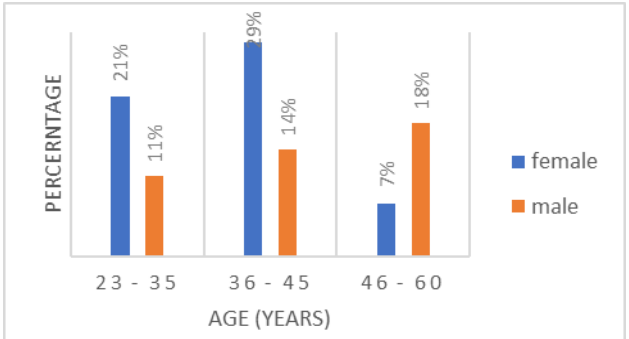

Figure 3. Representation of respondents based on gender; Source: own contribution

Based on the results of the questionnaire survey, we identified some of the challenges:

- *hard-skills development* – a crisis that arose during the pandemic clearly showed us the weak sides of digital literacy and the skills of the teachers, that need to be improved,
- *soft-skills development* – the marketplace requirements and development of society strongly demand that university graduates are expected to have not only know theories and have well-developed hard-skills, but also the soft-skills that are very useful in work-life,
- *identification and spread of innovative education methods and tools* that can be used in the education process at the faculty.

The mentioned challenges inspired us to update and enrich planned activities by following:

- workshops:
  - *presenting software* usable for qualitative research, text data management (Atlas.ti), learning design (Learning Design application), work with education platforms (LMS Moodle), teamwork (MS Teams),
  - oriented on *different teachers' soft-skills development* with practical exercises that can be implemented into the education process,
  - *presenting agile project management techniques – SCRUM methods.* Participants build the Lego robots based on the building instructions, and programming missions and underwent project management sprint planning. In this way, teachers achieve experience in how this project management method widely used in companies can be implemented into the HE educational process.
- *mentoring activities* for the establishment of professional support for teachers at the faculty.

V. CONCLUSION

The rapid changes in society go hand-in-hand with significant changes in the education field. Anymore, it is not possible to concentrate just on students' hard skills development, but more importance needs to be taken also on soft skills development. Digital innovation expands access to education and the quality of learning. As stated in [45], to transform education it is necessary to design, integrate and implement effective national policies and masterplans on learning making sure activities on the ground answer the needs of each country and community. All mentioned institutions, organizations and associations work on frameworks and different guidelines for the teachers working at different levels of education and different forms of education. At the same time, all worldwide institutions emphasize the importance of designing national frameworks and action plans for education innovation and transformation. Besides official documents, the best practice seems to be the community knowledge and experience sharing that help teachers to do better and up-to-date jobs. In this paper, we presented our activities concerned with the teachers at higher education institutions. Thanks to participation in the above-mentioned project, we identify the obstacles that slow down the education innovation process and propose possibilities for how to improve the situation at the faculty. The outcomes will be generalized and published to all Slovak educators interested in the transformation of education.

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