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REFLECTIONS ON THE ROLE OF HIGHER EDUCATION INSTITUTIONS IN INTRODUCING EMERGING TECHNOLOGIES INTO THE EDUCATIONAL PROCESS IN THE FACE OF THE PANDEMIC CHALLENGE COVID-19

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ABSTRACT

The pandemic COVID-19 has had an impact around the world and in the European Union, putting unprecedented pressure on education and training systems. It has fundamentally changed the way we learn, teach, communicate and collaborate in our education and training communities. This has implications for students, families, teachers, trainers, institutional leaders and society as a whole. Most European Member States have decided to extend the physical closure of education and training institutions, while mobilising alternative solutions and support for distance education and learning, especially digital solutions. This transformation has challenged education and training systems and stakeholders in these areas in Member States, particularly students and families, as well as teachers and trainers, but it has also provided them with valuable learning and training experiences, accelerated the digital transformation of education and training institutions. Emerging and disruptive technologies have undergone numerous and sufficient changes to ensure this. Thus, they will change the face and vision of higher education institutions.

KEYWORDS: COVID-19 education impact, disruptive tehnologies, knowledge-based-society, emerging tehnologies, educational management

JEL Classification: H75, I21, I22, I23

1. Introduction

History has shown that education is not only the key to better jobs and a better life for people, but also the engine of an important virtuous circle for the social and economic development of nations. The best educational outcomes contribute to per capita income growth. This in turn increases the potential for higher tax revenues in an economy. With careful policy and administrative decisions, this potential can be translated into real increases in tax revenues. Higher domestic revenues give governments more resources, some of which can be used for education. If used carefully and well, these resources can further improve educational outcomes and close the loop (Aristovnik, Keržič, Ravšelj, Tomaževič & Umek, 2020). Although the transition to digital learning has played an important role in the continuation of learning, the quality of face-to-face teaching and learning cannot be fully replaced by digital education. More than

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optimal and planned implementation of digital distance education, the sudden shift to digital teaching and learning is in many cases a matter of emergency (Hodges, Moore, Lockee, Trust & Bond, 2020).

Emerging and disruptive technologies have changed enough to warrant this and also change the face and vision of higher education institutions. Mobile devices, ubiquitous computing, and disruptive innovations can create new learning opportunities for higher education institutions as they strive to understand the knowledge-based society of the 21st century and beyond.

There is already evidence that in response to the COVID-19 economic and health crisis caused by COVID-19, governments around the world are investing $11.8 trillion in stimulus packages to save lives and mitigate economic and social shocks (European University Association, 2020). Only 0.78 % (or $91 billion) of these global stimulus packages were allocated to the education sector. Despite the enormous impact of the crisis on education and the growing recognition of the valuable role that schools play in modern society, education has remained largely invisible in many countries' decision-making about stimulus packages (Dans, 2020). Most countries have excluded education and training from their cyclical priority lists altogether. In low and middle-income countries that experienced an education crisis just before the coronavirus crisis, the effects of this fiscal neglect are most pronounced. Before the success of COVID-19, annual global education spending was about $4.7 trillion. While $3 trillion (65 %) was spent in high-income countries, only $22 billion (i.e., only 0.5 % of the total) was spent in low-income countries. This is despite the fact that there are roughly the same number of school children in the two groups of countries. Prior to COVID, the 2030 Sustainable Development Goal (SDG 4) for education was met by an annual funding gap of $148 billion for low – and middle-income countries. Add to that the additional cost of closing COVID-19 schools. And that increases the funding gap by up to a third, from $30 billion to $45 billion.

The challenges of ensuring that all previously enrolled children return to school when they reopen and continuing their efforts to include preschool children in the education system are particularly pronounced in low- and middle-income countries. The only way to address this dual challenge is to invest now in corrective action and re-enrollment campaigns. If successfully implemented, such programs could reduce the incremental cost of achieving Goal 4 by up to 75 %. It is important not only to increase the volume of international education aid, but also its predictability and effectiveness. Aid must be targeted to the countries and populations most in need, including those who have not been reached by government programs.

2. A Knowledge-Based Society Conceptualization

We have a society in which the conditions for generating knowledge and processing information have changed significantly due to a technological revolution focused on information processing, knowledge generation and information technologies. Although knowledge and innovation have always played a crucial role in economic development and growth, it is only in the context of globalization and the technological revolution of recent decades that they have consolidated themselves as key factors for competitiveness. Both developed and developing countries currently monitor their economic growth through the urgent and obligatory reference to benchmarks for knowledge, innovation and the promotion of human capital.

Unique assets such as knowledge and information and knowledge management are becoming a new core of competencies

in the new wisdom and society based on human intelligence and creativity. In the traditional economy, land, labor and capital were the factors of production, while in the new economy, knowledge has become an integral part of the current economic and social system.

The growth of innovations in higher education will have to be driven by 3 key factors: – accessibility, knowledge economy and globalization. This development will lead to more innovation in higher education institutions and the *"creation of independent educational institutions based solely on electronic delivery"* (Bates, 2005). With the advent of learning innovations through mobile technologies and computers, the demand for organizational structures other than those of traditional educational organizations has also increased.

Modern concepts of electronic economy and e-commerce require the use of a core set of skills in the context of globalization, where knowledge is the main driving force. The new economy presupposes a greater interest in the "wisdom society", in workers, in intellectual capital. Over the years, victory has been in the hands of those who have harnessed knowledge and are aware of its unprecedented potential. Knowledge is much more important than it used to be because we are in the midst of the economic revolution of the information age.

Value in third millennium societies is no longer tangible but intangible. Intellectual capital is the term used in connection with intangible assets that make the company efficient. It reflects the potential of an organization. Customers, distribution channels, various contracts and agreements can be examples. Intellectual property based assets include know-how, trade secrets, copyrights, patents or other rights (Peñalba-Aguirrezabalaga, Sáenz & Ritala, 2020). The legal mechanism to protect the diverse assets of the company is intellectual property.

People-based assets refer to the skills and creativity manifested in problem solving, as well as the qualities of leaders, entrepreneurs, and managers possessed by a company's employees. Individuals are not only capable of performing a specific activity, but on the contrary, they must prove to be dynamic individuals who can perform a variety of activities over time. As they become more competent in their work, people learn more and thus become more valuable.

Modern interconnected economies form a complex adaptive system. In such systems, natural resources are as scarce as the cognitive limits of individuals. The transition from the accumulation of physical capital – with diminishing returns – to investment in human capital, research, development and innovation – with increasing returns – is the engine of the modern economy. Investment in human capital, education, research and development provides positive externalities. The main pillars on which the knowledge economy is based are:

– technological innovations and research spending factors for the development of economic growth;

– learn from practice and disseminate knowledge data leading to greater benefits;

– capital accumulation, which creates positive technological externalities; Improve education and training, which would increase labor productivity as an engine for sustainable economic growth;

The state must play an important role in the knowledge-based economy. Public service priorities should be:

– promotion of public policies that stimulate investment (in research, development, education, technology, communication, IT); Subsidize the activity that generates positive externalities;

– creation of mechanisms to stimulate and implement innovations (patents);

– development of transport infrastructure projects; Support for investment in education.

What we need to do and understand is to move from the previous model of human society, based on progress through knowledge, to the model of the knowledge society. There is a difference between these two models. When society prefers to realize knowledge and predominantly consumes knowledge, it truly becomes a knowledge society.

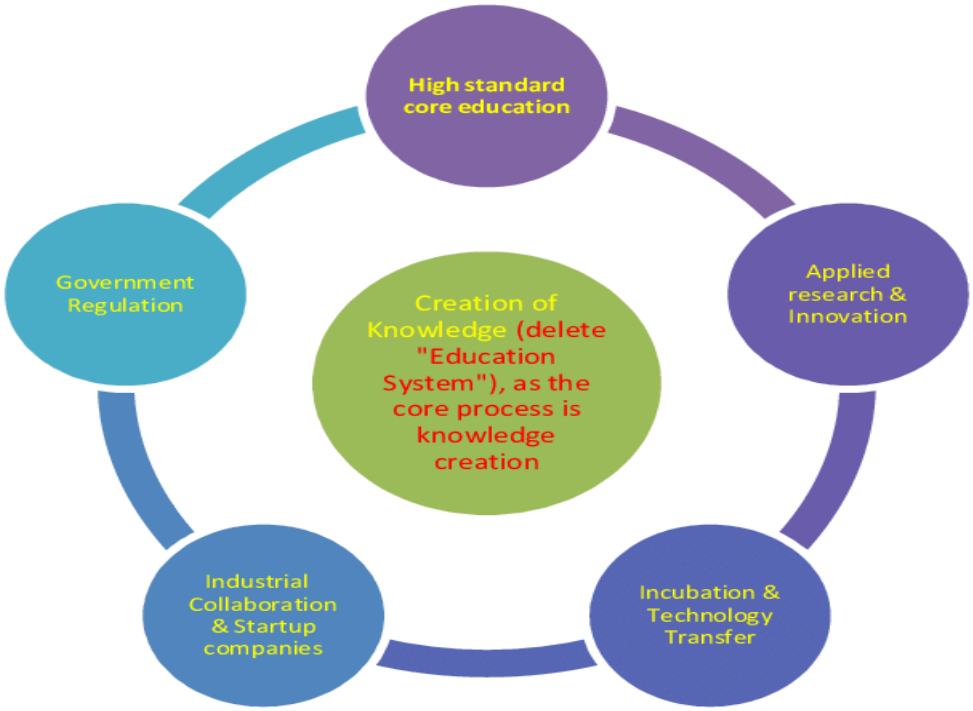


Figure no. 1: *Eco-system towards strong knowledge based economy*
(Source: Research Gate, 2015)

3. COVID-19 Crisis and Opportunities for Romanian Higher Education

It is to be hoped that the vast majority of higher education institutions will tend to become organizations in which good work and excellent learning are the hallmarks of excellence. When considering a new educational technology, an institution must anticipate the need for cultural change to maximize the benefits of the technology to the organization.

Higher education institutions should track how they are succeeding in adopting the new innovations achieved by the various emerging technologies. They also need to know how to plan, implement and disseminate these technologies as these things can and will have an impact in the future.

Universities in the post-pandemic world must develop a holistic approach to their relationships with society and incorporate a lifelong learning approach into their core teaching, research and service missions. The disturbing impact of COVID-19 over the past six months on the lives of citizens worldwide has made it clear that new definitions of normal life will apply in the future (QSQuacquarelli Symonds, 2020). Formal education from primary through secondary to tertiary levels has been most affected.

It has also become apparent that local leaders have found local solutions to deal with the virus, based on local experience, expertise and resources, and supported by local communities. In closed and digital schools, many vulnerable communities have been properly mobilized to support

learning for young people and adults outside the classroom and on campus through mobile phones, small study groups and 'travel'. The realms of life, study, work and leisure were suddenly irrelevant, with almost seamless, uncomplicated combinations of learning, studying, cooking, caring and entertaining.

What lifelong learning theories, advocates, or institutions had failed to do for decades, the pandemic immediately made possible. A simple phrase begins with lifelong learning: learning takes many forms, such as formal, non-formal and informal learning. Lifelong learning occurs in every area of life and in every walk of life (work, leisure, community service, family, etc.). Lifelong learning lasts as long as life and as deep as life.

Higher schools need to develop holistic approaches to connecting with the society around them in the post-pandemic era. As educational institutions are embedded in a local context, they need to proactively integrate their primary missions of teaching, research and service. It is in the context of all education providers that socially responsible higher education must link. The former separation of primary, secondary and tertiary education is now artificial as everyone needs to learn all skills: students, teachers and parents alike. People, families and communities are moving towards an uncertain but mixed future, with more responsibility for their health.These changes include learning new behaviors. As educators know, learning involves disclosure and is often very stressful and challenging.

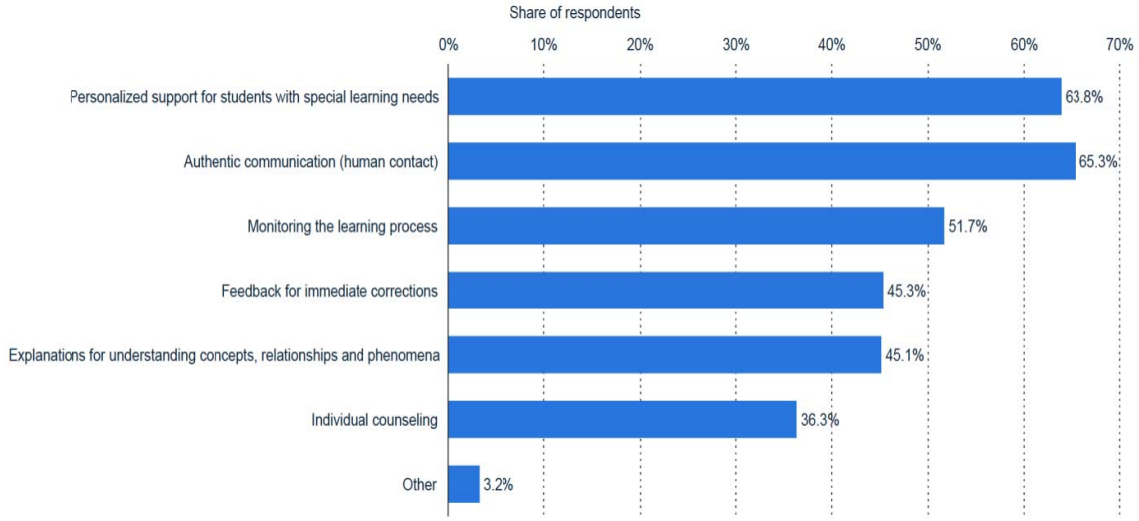


Figure no. 2: *Major restrictions of e-learning during the Romanian coronavirus pandemic in 2020* (Source: Statista, 2020)

Education is a domestic sector and is largely financed by public funds. Achieved outcomes should include access to performance-based funding for research and higher education and justification for the use of funds through public reporting and impartial external evaluations. The main objectives of the higher education system are to generate knowledge through the research system, to develop innovative ideas and solutions to Romania's social and financial problems, and to train quality human resources to implement these solutions through education and training programs.

The role of professionals and professional elite in these processes is

fundamental, as they generate ideas and solutions and consequently transform the knowledge and innovation-based global competitiveness, society and economy. Higher education is primarily based on merit and performance, while maintaining an inclusive and equitable character (assessed on the basis of individual and collective outcomes). As a field of national importance, largely financed by public funds, research and higher education must be accessible through public reporting and impartial external evaluations, justifying the use of funds.

Linking the Romanian education system to the development trends of the economy and to future development trends is essential for Romania's long-term sustainable development, but also for increasing the resilience of the education system and the economy in its fabric. The poor performance of Romanian students in international tests PISA and the low percentage of young people in Romania who have basic digital skills (only 56 % according to Eurostat data) are systemic challenges for the education system in Romania that need to be addressed. Therefore, in order to improve and modernize the education system in Romania and address the persistent problems in the education system, we recommend:

– Tackle school dropout through targeted national programs developed in collaboration with civil society and the local business community, including promoting the transfer of teachers to underserved areas.

– Improve offline and online school infrastructure and provide the necessary equipment and resources for a modern learning process to enable all students in Romania to have equal access to adequate learning conditions.

Ensure an individualized educational pathway for all students by reducing the number of subjects in the common curriculum and increasing the number of subjects in school choice to ensure a better match of developed skills and abilities to local needs. In addition, this approach would give students more freedom to choose subjects of study tailored to their interests and learning needs.

– Adapting the curriculum to the dynamic context of a digital economy and developing basic digital skills in students and teachers will help to create a learning environment that is tailored to the current needs of young people. By improving access to more opportunities for individual development, new technologies and information resources will be offered and the innovative capacity of young people in Romania will be promoted by familiarizing them with current economic trends.

– Partnerships between educational institutions, civil society and the business environment should be encouraged and supported, as they can ensure the alignment of the learning process with the real needs of the economy, but also the access of pupils and students to learning opportunities in a professional context. For example, through tutorial – programs, internships or volunteering.

– Promote the professionalization of teachers through the development of communities of practice and learning/development at school level, where teachers can achieve effective transfer of skills, for the use of teaching methods and tools adapted to the changing needs of teachers and students.

– Develop a national digital educational content platform that provides access to materials such as lectures, self-assessment tests, resources for asynchronous learning, and guidance for additional individual learning.

4. The Triangle of Knowledge – COVID-19, Universities and Societies

Mankind is living through a time of great uncertainty. It is not the first time that a pandemic has threatened the lives of millions. However, the speed with which

governments and scientists are responding to events is unprecedented. In an incredibly short time after the discovery of the coronavirus, public health measures were put in place and defenses in the form of medical therapies and vaccines were developed. In this precarious time, when the spread of information (and misinformation) from multiple sources is helping to spread panic, universities and the scientific community seem to be the best and most reliable sources of information, as highly trained personnel can combat the pandemic and its economic, political, and health consequences.

We are already seeing elements of this in the midst of a crisis. Institutions of higher education, particularly academic medical centers and individual staff and students, have in many cases responded with extraordinary commitment and determination, providing much-needed medical care and research to keep children safe. Students and their staff are helping local businesses by donating medical equipment, learning from their students, and getting involved in their remote communities. We are seeing medical professionals rebuild their labs to understand the virus faster. To provide much-needed protective equipment, we see technicians rebuilding their construction and manufacturing equipment. And in a global competition to develop vaccines, we are seeing an almost unprecedented level of collaboration and information sharing. This civic spirituality must overcome the COVID-19 crisis and become the hallmark of higher education.

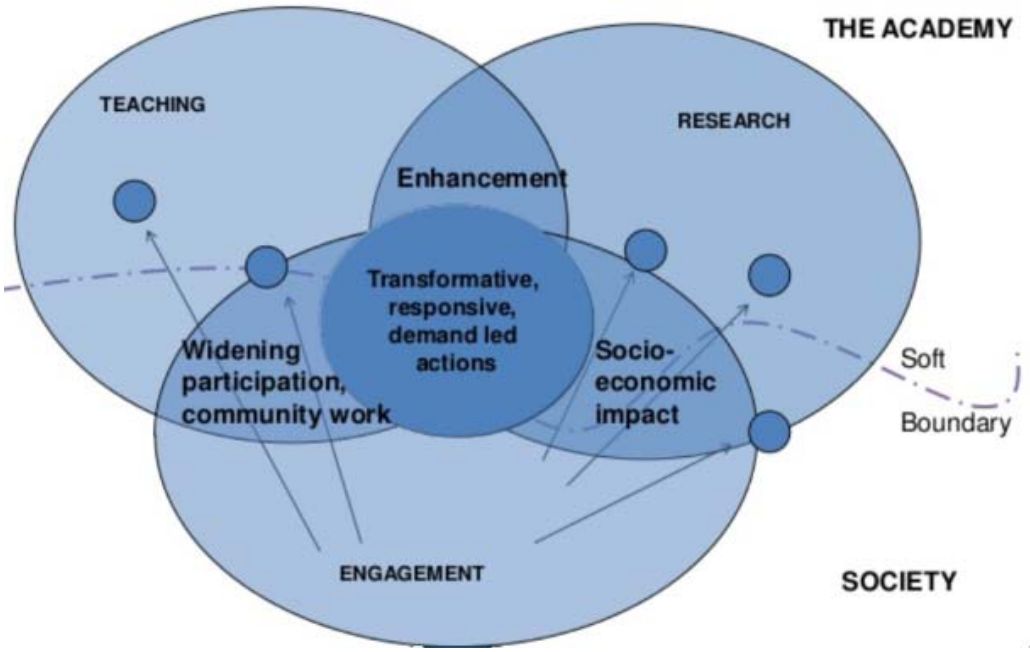


Figure no. 3: *The Academy world and society relationship*
(Source: University of Birmingham, 2020)

It is important to track and analyze how mobile devices, ubiquitous computing, and disruptive innovations will succeed in creating new learning opportunities for higher education institutions dedicated to understanding the knowledge-based society of the 21st century. It is easy to see that while technology is undergoing rapid change, people are not because they often only want to use what they are familiar with, preferring to adopt technology only when they see a clear benefit, either in productivity or savings.

In support of these ideas, I believe that any higher education institution that wants to remain relevant as a tower of knowledge transfer must have a strategic capacity for planning, implementation and dissemination.

According to the Council of Europe, higher education has four objectives: Helping students develop a sustainable workforce, preparing students for active citizenship, developing their personal skills, creating a broad base of advanced expertise, and promoting innovation and research.

The coronavirus crisis has clearly demonstrated the importance of healthcare to society. This is an opportunity for universities to increase not only the number of medical students, but also the number of places in allied health and healthcare. It also raises the important question of how universities can meet the need in public health, policy and business to work interprofessionally among health professionals and build multidisciplinary resilience. That said, we must also acknowledge that a severe recession poses enormous challenges for graduates and students entering the workforce. Given the inevitable and unprecedented financial pressures facing universities, these students have a moral obligation. They should seek more resources in workplaces, support internships and volunteering, and take responsibility for developing skills beyond radiation education.

The government had relaxed its budget rules before the pandemic and committed to unprecedented investment in research and development over the next few years (The Economist, 2020). Despite the huge financial burdens that the government will face, where the focus of these investments may change due to the pandemic, we believe that the government will stick to this commitment, mainly because it will boost the economy. The crisis we face has brought to light a number of national vulnerabilities, including the ability of the public health system to conduct effective testing to prepare for health crises. We believe that the "health security" research area are important growth areas, including virology, diagnostics, medical devices, public health, and medicine. We hope that social science research will not only help science, medicine and technology, but also play an important role. Logistics, operational research and health economics will be crucial through our actions to improve our public health system. Universities also play a greater role in civil society, promoting the role of arts and sciences in areas such as ethics, governance, communication and wellbeing. Education is one of the sectors most affected by the current situation, although this may not be reflected in public perception. First of all, the visible problems, the medical crisis and the current exponential development, are mentioned, together with the medium and long-term prospects for material security (the threat of economic crisis).

The "closure" of schools and universities is an extreme measure for any historical period and for any society, with serious consequences, especially in the medium and long term. Educational systems are fundamental mechanisms that guarantee not only the education of younger generations, but also the stability of the family, the social order and economic development in line with sustainable values, the importance of which we are now pointing out. The educational levels are organically interconnected (pre-school, secondary, baccalaureate, college, postgraduate), but also with other social systems (economy, labor market, social protection system, communities and central/local public administration, etc.). Each educational level is a part of this big domino that represents the whole Romanian society. Interventions in all parts of the educational system have an impact on the whole social system and on Romania as a whole. The parts of a domino can be easily shifted and rearranged, but they should not be abrupt, as they can have disastrous effects overall.

5. Conclusions

COVID-19 shared the high value of universities and offered universities numerous opportunities for change. I consider that the role of the University must be re-evaluated. In support of future economic policies and health initiatives in particular, governments are using higher schools in order to provide the research and information required.

The coronavirus crisis also has, of course, sharply emphasized the importance of health care and education to society and offers universities the potential for the increase not only of the number of medical schoolchildren, but of the combined professional healthcare and public health programs. I believe it is important for the institutions to respond to and build multidisciplinary resiliency and the requirement of inter-training among future graduates in several areas that impact health, politics and economics.

Universities need to become WiFi towers where technology facilitates the transmission of ideas to anyone ... whenever, wherever, and wherever the student is, providing instant access to the information needed for learning.

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