

# POSITION OF UNIVERSITY AND HIGHER EDUCATION IN THE CONTEXT OF TECHNOLOGICALLY CONDITIONED SOCIAL ENVIRONMENT

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## Abstract

As a driver of development and progress, education has been at the centre of everyone's interest at all times. Issues and problems of education, reforms aimed at modernizing the education that need to be introduced as soon as possible are in the focus of contemporary discussions. However, modernization of education system requires deep and thorough analysis of reforms applied in the past, as well as the analysis of present situation and its social, cultural and scientific characteristics. As a society and as civilization in general we seem to have left behind the Humboldtian idea of university and education after the first taste of ICT benefits. Unable to precede them, the education must go hand in hand with changes that fuel the development. Today these changes are much faster and the classical education system is not able to keep up with them. The purpose of this paper is to offer an analysis of previous targets of the education system and detect the essential characteristics of the present situation, preparing that way the foundation for mapping of the path we should follow in the future.

By means of qualitative analysis of past and present educational policies, authors will offer possible answer to the question where we want to arrive so that we could be able to choose the path we want to take. If "Historia est magistra vitae", then history also offers us a glimpse of the future. Any relevant prognosis based on qualitative research of internal logic of the development of specific scientific discipline, education science in general and all manifestations of that logic necessarily addresses three time periods: past, present and future. In that context this work will show that the element of technology played a key role in the organization of Universities and educational policies from the emergence of writing to Gutenberg and up to modern ICT. We are not sceptical in our approach to technology. Quite the contrary! We will highlight its importance, especially due to the fact that science and education always imply understanding and use of information, which makes the ICT an essential component in rethinking of educational policies in all existing segments. At the same time, however, work emphasizes the need for serious consideration of the element of anthropocentricity and the necessity to actively include it into educational policies. In accordance with that, work provides an analysis of continuity and representation of Humanities and Social sciences in creation of educational policies and shows the undoubtable importance of those segments in predicting and forming the educational systems of the future.

Results of the research confirm the conclusion that science follows the experience of tradition and of accepting and confirming changes. It reflects contemporary views and needs, but also contains inherited ideas and methods that can help it discover new possibilities for the future. Finally, work emphasizes the thesis which hasn't been appropriately articulated in scientific literature, namely the need for balancing and communicative connection of two very important components – STEM area of science and disciplines from Humanities and Social sciences. In synergy based on well-structured strategies of interdisciplinary research, these two poles can and should play a decisive role in shaping of educational policies of the future.

Keywords: Education development strategy, higher education, Humboldt, ICT, university.

## 1 INTRODUCTION

Central place in the development and progress of a society undoubtedly belongs to education and a close or better yet inseparable segment manifested in scientific and technical achievements of a specific historical moment. Education, science and technology are exceptionally important complex mechanisms that cannot be viewed separately, nor is it possible to separate them from a wider political and economic environment they appear in. Alongside analysis conducted in a specific scientific field, any consideration of education for a modern age should take into account new technologies, history, philosophy and political guidelines which strongly influence it. This paper opens many questions, offers answers to some, while others are used as pointers for further exploration of

the topic. Along the lines of the above mentioned parameters effecting education in a substantial way, we will point out that on the one hand the education system is shaped by practical and theoretical application of all scientific and technical achievements, while on the other it's regulated by legal framework and curriculum. Education system is therefore in a challenging position primarily because the inevitable changes in society enter the education system very slowly, while at the same time work market changes much faster and generates a crisis unresolvable within the framework of classical education system.

Having that in mind, it's clear that the changes in the education system are necessary and cannot be postponed. It should be noted that experts and scientists who are dealing with education system analysis and at the same time actively participate in the system cannot be the exclusive initiators and executors of education reforms. Before possible introduction, necessary changes in education system call for a deep analysis of previous system reforms. Until now, such analyses were almost always highly arbitrary and, in many cases, politically structured. We should however try to find a route towards wellbeing of the community and progress of society by way of evaluation of previous reforms and subsequent design of the ones which are upcoming. Regarding the evaluation of previous reforms, we think that the qualitative analysis of curriculum, learning outcomes and results of the education system could provide a valuable overview of values of the system, which in turn can be used as basis for necessary changes [1]. The other approach could include application of qualitative method to the analysis of historical development of science and disciplines dealing with education, all in the interest of finding causal connections between curriculums on one side and developments in science, technology, society and economy on the other.

## **2 IMPORTANCE OF THE ANALYSIS OF EDUCATION REFORMS IN THE CONTEXT OF NATIONAL POLITICS**

Narrowing the field of interest, we are focusing on the national framework or specifically education system and education policies of Republic of Croatia. Since the creation of sovereign and modern state of Croatia, we had fourteen governments and 22 ministers of Science and education. In the beginning there were two ministries, Ministry of education and Ministry of science and technology, which were joined in 2003 into Ministry of science and education. An interesting fact is that technology has been deleted from the name of the ministry. That fact is very important especially if we consider three key elements that form the curriculum, elements vital for the evaluation of the education system in general. These are: scientific and technological development, social and economic status and a pupil [2]. It's important to point out that course curriculums and education plans are signed by minister and ministers are politically installed. Any changes in national curriculums on all levels of education can therefore be reviewed and analysed in that context as well. National curriculum opens the possibility for schools and teachers to apply different methods in teaching of the programme. In the attempt to detect and question the reasons for changes, we are faced with the fact that reasons listed in the form of new proposals, as well as the contents of such reforms are not based on elaboration of values of a theory providing a basis for the idea of the change or the ability to provide us with a coherent interpretation of the phenomenon of education. Interpretation and subsequent confirmation of changes are primarily dependent on politics and its attitudes. For instance, after the creation of the state choice had to be made not only between the theories of education, but also between politics and confidence in minister who created the proposal. What was unfortunately not addressed and discussed are the arguments supporting the proposed changes and the pedagogical consideration of technological change based on convergent theories.

The influence of political substructure on education turned out to be very significant, while the influences of political concepts on the development of pedagogy as a scientific discipline were and still are visible and reflected in reforms of education much stronger than concrete scientific concepts. In order to detect and understand the direction of development of the education process, we must take into consideration the level of influence of scientific thought and much faster technological development, as well as the work market which needs and expects an educated workforce. In doing so, we always keep in mind the fact that from the 17th century scientific revolution and the birth of modern science, from the invention of printing machine to contemporary powerful computers and big data analysis we are faced with constant changes and flux as a revolutionary walk of qualitative and quantitative measuring. Changes are to be discussed in accordance with historic context they are a part of. They are obviously not experiential and cannot be applied to other times without modifications. Yet, the experience of changes generated by reforms of education based on specific concepts is more than valuable and usable. Education was initiated by the development of scientific and technical

achievements and we believe that it's possible to have a more clear view of the future by taking into account the mutual goal of both branches (knowledge and skill) and the fundamental qualitative content analysis of scientific facts. By facts we mean those important achievements such as writing, printing machine, powerful computers enabling data and information analysis as well as storing and dissemination of recorded knowledge.

Research of formal organization and functioning of education, as well as the analyses of scientific papers, enable us to follow the forking paths of reforms. By following the development of science and technology, as well as its application in education, we are reading the past and present while trying to predict the future and find the line we should follow. Finally, alongside the developments in scientific discipline and information-communication technology (ICT), predictions must take into consideration the social and economic status of society.

### **3 EDUCATION AS RESPONSIBILITY FOR A BETTER FUTURE**

New social, economic, scientific and technological context requires adjustments to the needs of work market. Need for adjustments in most cases calls for changes in curriculum. If we compare the characteristics of changes with concurrent developments in science and practice, social status of the state reflected in the infrastructure as a basis for the execution of curriculum and the tempo of development of scientific discipline, we come to conclusion that curriculum is behind schedule in adjustments to practical needs for logical reasons. Extremely fast quantitative development of technology is not followed by the equally fast improvements in qualitative indicators of results of the education process. We often hear the question: should the changes be initiated by universities which educate teachers/professors who in turn apply this new knowledge and skills in execution of curriculums of specific courses or should the changes start from the reform of elementary education? In the context of European education, discussions on changes in national curriculums followed the opinion that Europe could fall behind economically and that creation and execution of new curriculum is the path to recovery and a better future.

Importance of changes and the importance of education as a driver of these changes is a topic of strategic documents of EU elaborated during the process of globalization and adjustments to scientific and technological changes [3]. We believe that the reform of education process should have been conducted on the lines of these policies and developments in science and technology. Information-communication technologies (ICT) should become an integral part in creation of education policies in all segments, which is a conclusion confirmed by all relevant documents of the EU dealing with education. Science and education are a point of meeting and intertwining of new technologies and information. They are both at the same time the way of understanding and the use of information. Mutual relationship and the speed of development of science, technology and practice is conditioned by an important role of education in the responsible approach to future. Following this line of thought, we would like to highlight another interesting fact. While researching the market needs for certain professions and workers we came to notice the analogy between these needs and the exponential growth rate indicating the speed of production of scientific papers in all disciplines focused on education dealing with new occupations, education reform, theory and policies of education. Large part of this production highlights the importance and the need of establishing the balance and communication between two exceptionally important components – STEM area of science and humanities and social sciences. In synergy based on well elaborated strategy of interdisciplinary research, these two poles can and should play a decisive role in designing of future education policies.

### **4 THE ROLE OF SCIENCE AND SCIENTISTS**

As a system of knowledge, science and its individual branches (pedagogy, psychology of education, sociology of education, education policies) do not evolve along some perfect trajectory. They change constantly, following a complex curve which shows also the periods of major growth in production of papers dealing with topics which reflect the interests of that particular moment in time and particular approach to topic. These irregularities in general development are related to speed or better yet inability of those systems for quick change and practical implementation of changes. Radical transformation needed by the education system paired with demands of the work market and practice in general led to conceptual separation of human and social and towards technical and specialist education.

Education is now focused on teaching as providing specific competences. That twist in understanding of the purpose of education and removal of human aspect from upbringing and education gives justification to the fear about the future. We can safely say that the output of the education is no longer conceived on human ideals, but on the vision of a successful entrepreneur [4].

Such a change in understanding of the purpose of education, knowledge and university makes us wonder whether we entered the era Liessmann [5] calls the *era of miseducation*, in which the idea of education ceased to fulfil its normative or regulative function and the spirit of humanism is banished from science.

It may seem bizarre to discuss the synergy of information science (ICT) and humanities, but history shows us that theories and education policies of the future should be constructed and developed precisely on synergetic efforts based on well-conceived strategy of interdisciplinary research. Elaboration of that idea brings us back to Humboldt's [6] university striving towards the ideal conjoining of life and creativity. Joining the education, scientific research and practical, expert inputs into a basis for understanding of totality of the world is the idea which is still alive in this time of technology without which there would be no progress and development. However, in the context of possibilities of new technologies and utter disregard for social and human framework, it seems responsible to clearly sound the warning about the possible disappearance of positive good. For that reason, it is so important to discuss and debate the importance of connecting these two seemingly disparate segments. Our role is to identify those elements of dominant discourse which could contribute to development of education in present circumstances, but also highlight the importance of humanistic concept leading to sustainable social development.

Optimistic view of the future shows the introduction of advanced strategies while the barriers met by the education policies and reforms enable us to reconstruct the past and offer models for creation of economic, social and cultural organization which should and can be supported and sustained by the education of the future.

Evaluation of the existing system will significantly help the realization of the ever so necessary education reform, but without the educated teachers to execute the curriculum we will once again end up with nothing but laws and decrees. This is where science and universities come in as breeding grounds for ideas and knowledge. Science and scientific and technological development are closely connected to prediction and prediction of the development of science and technology has special importance. Same goes for predictions about their implementation in social and economic environment and the way they are to be communicated within the education process. Relying on the past experiences and present results, we can at least sketch the problems we will face while predicting the future of education. The content and the level of accuracy of such predictions is determined by scientific information, historic experience, knowledge and conceptions we are familiar with as well as possibilities whose realization depends on politics and economic status of the society.

Strategic documents of the EU as well as ones in the Republic of Croatia undoubtedly confirm science, education and ICT as foundations of economy and social development. ICT is a strong initiator of changes in all spheres of modern society and in the sense of application it permeates all branches of culture, education, economy and science. Interdisciplinary and multidisciplinary approach supported by new ICT should therefore enable and alleviate the challenging process of decision-making in education planning and practice. This will open a path to a new concept of education shaped also by social parameters and a well prepared national curriculum supported by the education of teachers/professors. As university professors and scientists, this is where we see our role and responsibility.

## 5 CONCLUSIONS

Represented theme is highly contentious in nature which makes it very hard to describe it as an organized, coherent and unified entity. It forks in several directions some of which we merely indicated, while others got much more of our attention. We find it inciting and believe the paper to be a foundation for future research of education and science as crucial elements of social progress and development. It's a topic which opens many questions, but it should be noted that the answers offered in this article are valid only now, today. With new information, new technologies and new experiences emerging on daily basis, tomorrow will bring new understandings. There are too many mutable variables influencing the truth of possible answers so the answers cannot be close-ended and finite.

Predictions based on qualitative research of the internal logic of the development of a specific scientific discipline, of education sciences and all manifestations of education always consider three periods: the past, the present and the future. Turning to the past, we grasp at experiences and ideas from different scientific areas, while present grants insight into technological advancements, possibilities for analysis of scientific information and potential application of these information in other, non-native areas of science. Information-communication science developed techniques for searching, processing and transferring of data and information. It created scholarly systems and artificial intelligence, but also initiated the development of a digital age. It's there that we should search for different possibilities and solutions such as, for instance, the possibility to mechanically process and represent the development of specific process in a specific time-frame and then by comparing results of the same research from different time-frames try to predict future developments. As mentioned earlier, the development of education is regulated and determined by ministers who alongside their scientific reputation bring in their political affiliation. This means that, in addition to all other previously mentioned parameters, discussions on education policies and reforms, as well as predictions about the future developments should take into consideration the political concepts of the political platform which appointed the minister.

Many important documents of the European Union approach the process of social development as a global process of development of Europe. Urged by many defects revealed by globalisation, Lisbon declaration from 2000 brought guidelines granting the education the key role in social development. By way of recommendations, European Commission tried to introduce them to national level. The main task of education becomes then the adjustment to these processes by way of redefining of the old paradigm and charting the path towards new society based on ICT supported science in new curriculums [7].

Thorough reform of the entire system calls for curricular coordination and repositioning of scientific and technical achievements and results of different disciplines in natural, humanities and social sciences. It calls for teaching methods resulting from qualitatively reformed pedagogical science. The level of falling behind in that area was revealed to the world by the COVID-19 pandemic, which proved to be a significant and challenging moment for education process on a global scale. We are therefore convinced that the digital educational surrounding represents an altered educational surrounding in which teachers and professors can perform their educational responsibilities if they broaden their acquired educational skills with digital competences. All of the above brings us to the conclusion that the reform of education, which calls for directions and will probably be marked by active implementation of ICT and development of digital literacy, is essentially inevitable. Question remains will those changes be in line with the needs of society or better still will they support and effect the forming of society based on knowledge and tolerance? Answer depends primarily on the direction we will take. We are aware of the fact that it's hard to revive the romantic understanding of university and science, but we also believe that striving for preservation of local languages and cultures should stay recognizable in the context of global values. Same goes for the desire for knowledge within the society in which the rules are not set by the market, but by an educated group of individuals capable of shaping the market for a modern age. These goals can be achieved only through dialog, through interdisciplinary and transdisciplinary cooperation, through active participation in an attempt to create a synergy between humanities and social sciences and STEM area of science, while the attempts to widen the gap and incite a schism should be a thing of the past.

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