Indefinite "Coup" of Digital Education and Certainty of Reality

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Abstract—**The authors continue the global discussion on the new tasks of learning and education management. The main question of the discussion: "How to prepare the next generation for the uncertainty of what is happening in the digital world, the labor market and social systems of global change?" The exponential growth of technology is causing global social change. Our future will be filled with tremendous opportunities, but it will also become a world of great uncertainty. High rates of innovation constantly "destroy today's reality" and create the uncertainty of the present and future. Therefore, it is necessary to reflect on the skills and capabilities that are important in conditions of extreme uncertainty. Based on their own experience of interacting with students of the "digital generation", the authors propose several areas of pedagogical activity on the eve of the "digital world": the formation of creative thinking, the development of entrepreneurship and enterprise, the development of teamwork skills, the consideration of ethical issues, the development of interdisciplinary education. Perhaps metaphorical thinking in areas of knowledge that seem to be not directly related to digitalization will help to understand future changes in the digital world. Much of the discussion about how to teach the digital world seems too simplistic. In particular, the value of distance learning is exaggerated. The creation of an educational laboratory environment seems more promising. The most important argument in favor of changing the approach to education in the face of uncertainty is the expectations of the informality of the youth itself.**

Keywords—definiteness, uncertainty, formal, non-formal, education, digitization of reality, tasks, control, compatibility, exclusion

I. INTRODUCTION

Whatever country the teachers are working in, they face the question: "How to prepare the younger generation for the uncertainty of what is happening in the digital world, in the labor market and the social systems at the time of global change?" World education management practices consider it the primary issue for today. It is no longer enough for the world pedagogy to have only updates and upgrades. Moreover, it is not enough for the heads of educational establishments who set the direction of education strategies at all levels only to discuss this topic.

Instead, a completely new approach to education is

necessary in practical educational trends in schools, colleges and universities. The most courageous education managers call it a 'coup' of events, and, as a result, a replacing of the world education formal achievements by the informal ones [1].

Dissatisfaction with the current state of world education is connected with the exponential growth of technology. Today, we are experiencing the 'digitization of reality' that is the result of the global spread of new technologies. We all now live in the 'digital world' characterized by rapid, technology-based, social change. Therefore, our future will have tremendous opportunities; likewise it will become a world of great uncertainty. On the one hand, the uncertainty vector is hypothetically impossible, for it requires directionality. On the other hand, we are talking about a new task of finding certain tendencies in an 'indefinite setting' of the real world.

Such uncertainty creates serious problems for teachers all over the world, for managers and the subjects of education. Taking into account the current pace of innovation and shorter innovation cycles, it seems obvious that new technologies will continue to transform every aspect of the definite that we have today, of what we get from life and work. Continuous technological 'destruction of today's reality' though seemingly new, is definite and normal. However, the progressive educational community understand that the previous educational concepts, models, paradigms and ideas of the 'old world' will no longer be relevant in that part of them that are beyond the digital technologies of the future. At the same time there is an understanding that the spiritual humanitarian aspect of education must be preserved under any conditions and not run the risk of being absorbed even by the latest technology. Otherwise, the risks will spread to the mechanisms for the preservation of human capital. In the world educators' discussions this is called a "direct threat" to preservation of a human in a person.

What should we teach our students of pedagogical universities today [2]?

Learning has always tended to be 'reverse'. Transfer of well-established knowledge of the past served as the starting point for our entire approach to education. The idea was that if one understands past events and knowledge, one can solve future problems by applying old doctrines in a new situation. A similar logic can be observed in many areas. The responsibility of the teacher was to transfer this

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information. In the world of information asymmetry, the relationship between teacher and student, professor and student was, if necessary, hierarchical, for both the teacher and professor possessed all knowledge [3].

II. Dyssynchrony Education Model

What is the disagreement between the world of reality and the world of the future, the world of the digital? But in the world of uncertainty and constant change, this model of education seems insufficient: synchronous or dissynchronous [4]? If the future is radically different from the present, it does not matter much to focus on the content, which, according to analysts, in the near future may become insignificant. Moreover, the availability of information means that the informational advantage of a school teacher or a university professor is much less important. Let us assume that we agree with this fact. As a result, education should become much more 'promising' and be based on the skills of tomorrow. How, then, should we prepare the younger generation for addressing unknown future problems? As it was mentioned, it is not enough only to update and upgrade the existing educational programs or courses.

III. Certainty of Reality by Comparison Method

We conducted a comparative analysis of educational programs from 5th to 11th grades in mathematics and physics in the Russian Federation and the educational program, the mathematical analysis of the first year of a specialized faculty at a pedagogical university. Using the methods of identification and content analysis, we found, in almost all programs, a static approach to the presentation of the material according to the "formula – theory – formula – problem – control of the result of the task assessment". We assume that it requires technological and applied analyses.

For, to get started anyone will need a much better theoretical understanding of technologies related to computers, communication networks, artificial intelligence and big data. For many of us, the basic technologies that drive social change remain a mystery, and this presents a problem. Many teachers of the world are aware of this problem, but the school and university educational programs, as before, often remain outside the space of technology, especially applied ones.

Practical technical knowledge must be integrated into many areas of education. Data coding and analytics are a good starting point.

Nevertheless, we also need to think about other skills and opportunities that are important in the world of unprecedented change. Emphasis should be placed on building skills that will help the younger generation to make adequate decisions in the face of extreme uncertainty.

Based on their own experience of interaction with schoolchildren and students of the "digital generation", built in the form of multilateral communication, the authors

propose several areas of pedagogical activity on the eve of the "digital world". As a matter of fact, several fundamental considerations are of prime importance:

A. Formation of creative thinking

The next generation should be able to think fast and give solutions 'out of the box'.

The key point will be a dynamic analysis of complex situations and an ability to communicate with solutions, in multi-presentations or in the form of multi-videos.

B. Entrepreneurship and enterprise

In the future, we will see more open and freer organizations and social platforms. Therefore, it is important that the younger generation should find ways to become productive and self-motivated, that is, they should know how to act without a boss / leader who could tell them what to do.

As the traditional concepts of 'career' become much less relevant, it is becoming increasingly important to create a personal brand, the right story, and a new community.

C. Teamwork

More open organizations mean that one needs to work in a team of strangers, often from different national or disciplinary backgrounds. It is essential to be able to work as a team, constantly adapting to new situations and working models, multicultural linguistic rules and paradoxes.

D. Ethics

Many of the problems of the future will be ethically complex. This is especially true in the context of robotics and artificial intelligence. Ask yourself, if you know anything about the nine ethical problems in artificial intelligence.

The robot revolution is gaining momentum, but does it correspond to our human values?

It is noteworthy that all new technologies cause complex ethical problems. Building students' ability to think about the ethics of the relationship between a person and a robot is a way for the teachers and professors to increase their professional value.

E. Interdisciplinary education

Finally, we must be open to interdisciplinary and multidisciplinary research, and knowledge.

For example, and this is just a subjective opinion of the authors of the article, we think that a profound knowledge of biology can help to prepare the younger generation for the challenges of the future. Is it really so?

Partially, it reflects our preference for the metaphor of biology for understanding the recent changes in the digital

world. Possession of a thorough knowledge of biology can prompt that the digital system can be viewed as an open and comprehensive 'ecosystem'. Is it not surprising? It can be assumed that metaphors and their consideration in knowledge related to 'environment' and 'evolution' will be as useful, as understanding of metaphors. The main thing is that the student's mind should be able to perceive them [5].

The above reflects our belief that the next big wave of innovation is likely to be in the field of biology and that new knowledge in this area will set the tone for new interdisciplinary research and experimentation.

Of course, we can be wrong, although the main idea that multiple perspectives impact can help to prepare the younger generation for the 'uncertain' future is undoubtedly true. If you have other arguments, we are ready to discuss and reflect on them.

How should we teach the younger generation? What teaching methods should we use to be effective teachers in the digital world?

Teachers at all times reflected on how to improve their work. Now there are a lot of discussions on this issue, though for the most part they seem too simplistic.

In particular, special attention is paid to the discussion of distance learning or online learning. The idea is generally up-to-date. Still, it is naive to approve of the idea that everything can be placed in the Internet. Evidently, some groups of students can get an access to information that they would not otherwise have had, and this is obviously good. At the same time we believe that educators should also be aware of the risks of such an approach and warn about them. In particular, this approach preserves the traditional hierarchy of teachers and students, students and professors and focuses on the content of knowledge.

Instead, it seems that it is more promising to create 'denser and unique' educational environments – 'laboratories' in which students are encouraged to be creative and enterprising. In this case students will have to work in teams and think about possible scenarios with appropriate subject problems and interdisciplinary solutions. In consequence, it will be possible to predict the development of abilities associated with the digital age, and the possibilities associated with the development of the abilities to 'adequately survive' in the digital environment.

IV. THE TRANSITION FROM REFLECTION TO ASSUMPTION

We admit absolutely honestly that, perhaps, the most important argument in favor of changing the global approach to education is the expectations and demands of young people. It seems obvious that the younger generation is waiting for something different from formal education. The traditional formal hierarchical approach simply tires them out [6]. They just 'turn off'. The temptation to 'live' in the mobile phone or just miss a class or a lecture is too great. "Why go to the classroom if I can get the same (or even better) information on the Internet?" – Alas, but we

hear it from our students rather often of lately. So it is necessary to "turn on" informal technologies and introduce them into the practice of pedagogy. What is more, applicants to the universities of today have been born in the digital world [6]. They belong to the digital culture in communicating with the world and with one another, the culture that has no memory of the pre-Internet age of those people who teach and educate them. Young people are fully immersed in the digital culture and all its relatively easily accessible possibilities that are a stumbling stone for the 'pre-Internet' generation.

V. REFLECTIONS ON THE PRACTICE OF PERSONAL EXPERIENCE

It is necessary to adapt the personal pedagogical experience to the global trends of the digital age, to move to a more informal educational structure, and to develop a predictive thinking of social change. The technological potential of already existing elements of the digital world far exceeds our knowledge of how to use it. High rates of innovation constantly destroy the current reality and create the uncertainty of the present and future. Digital technologies even change the way we see ourselves; therefore, how do we teach ourselves to live in uncertain conditions? We need to think about the skills and capabilities that are important in the face of extreme uncertainty.

It is interesting to ask the question about the quality standards of education in the conditions of uncertainty and the guarantors of the quality of education.

Summing up, belonging to the pre-Internet generation we realize the risks that if we do not adapt to the new reality, we are doomed to be excluded from social life. One has to agree that slow subject-specific analog thinking is not appropriate for an indefinite, rapidly changing environment.

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