Education in 100 Years: Challenges from the World Beyond

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What will education be like in 100 years? The simple answer is as follows: education will be the driver of a new knowledge-based economy and society. This type of education will promote values that are shaped by society and include academic freedom; student self-government; the establishment of self-governing research teams composed of professors and students; a dynamism in constantly generating and mastering new knowledge and competencies; and the ability to concentrate intellectual and financial resources on key topics of interest.

The education system in 100 years will move into the virtual world through a "real" system of education. It will not reflect the educational infrastructure of the physical world, since this new system will develop with unlimited educational resources. Nevertheless, over the next 100 years we must develop elements to maintain confidence in the system and provide for mobility within it. Education refers to an array of benefits that rely on standardized mechanisms of accredited certifications (certificates, diplomas, certificates) deemed valid by all stakeholders. These mechanisms include quality assessment and programme validation procedures; proper reputational institutions governing teaching staff and their courses; and transparent procedures for checking compliance with standards. Such mechanisms should operate throughout the entire system at all grades and have a clear relationship with the pool of qualified laborers, since employers have to be confident of the qualifications of applicants to teaching jobs. Education functions through a symbolic brand market, so without branding and active rebranding the virtual education system can only represent a marginal addition to the real world.

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What will be the key issues in the future? Challenges include navigating and accessing expanding resources, developing optimal strategies, mastering educational courses, and creating search engines for identifying solutions. Time will be the scarcest resource for educators in the years to come. In contrast to education, time is not an indefinitely expanding resource. One can certainly condense time by intensifying its use, but this process has its limitations. Therefore, by providing educational institutions with the freedom to achieve long-term funding and the right to manage these funds *ad libitum*, we gain the opportunity to engage in tactical cost management decisions over strategic performance or, in other words, to invest in the creative class which, as R. Florida put it, will change the future.[1]

Early Development: a Somersault with a Handspring

Back in the late XIX century education was elitist. The transition to mass education was the most important development in this sphere over the past 150 years. The idea that education was not a hereditary privilege but a common good, which should be available regardless of income, social origin, nationality or religious affiliation gained ground practically all over the world.

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Although not all children in the world attend primary school, universal secondary-level education is commonplace in most countries. Higher education, regardless of whether it is in demand in the labor market, or whether people work within their specialty later, is gradually becoming a social norm in many developed countries, primarily European ones, including Russia.[2]

A century and a half ago, pre-school education was simply unthinkable. Only 10 years ago kindergarten was perceived in Russia as an institution designed only to help working mothers. Therefore, the number of kindergartens was regarded as sufficient if it was able to accommodate 60% of children of working mothers in cities and 40% of those in rural areas.[3]

Now the situation has changed and kindergartens are regarded as educational organizations. Over the past three years many countries, boasting high educational accomplishments for their schoolchildren, namely Finland, Sweden, Britain and Australia, have adopted new programmes and standards for preschool education and have devoted more attention to early childhood development. These countries are implementing policies that understand the high return from investing in human capital development at an early stage, a fact substantiated by the work of Nobel Prize Winner James Heckman.[4] It is now understood that early childhood development in team settings is extremely important, where children can be socialized and master collective learning skills. Such education cannot be replaced by family upbringing or the cultural programmes of the parents.

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In many countries (for example, Britain, France and Germany) compulsory schooling begins at 5 years of age, which is much earlier than in Russia. To prepare the child for school, since the 1970s (with a boom in the 1990s) early childhood development programmes have been introduced, including such examples as Russian "From birth to school", "Rainbow", "Origins" and others.

J. Heckman proved that investing in early childhood development yields better results than the doing so at later levels of education, which makes an early start for education quite pragmatic. At later stages, children absorb knowledge with less effort and feelings of social inadequacy decrease considerably. In addition, early education is

an essential part of a policy aimed at overcoming social inequalities (ethnic, cultural, etc.).[5] Its aim is to provide opportunities for children from migrant or poor families to study in school equally with others. At this age, educational technologies allow children to overcome many developmental challenges, both physical and mental.

Over the next 100 years this trend will become the norm. Early development through the interaction of the child and the teacher will become the key component of education. The latter will "live" both in the real world and the virtual one, helping to establish communication with the physical world.

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Secondary Education: Arched Somersault

Mixed schooling systems or co-education, i.e. when boys and girls attend the same school, have become the main development in secondary education in most countries around the world over the last century and a half. With regard to culture, this is an extremely important change, since the school is a model of society, and the task of child socialization is no less significant than that of knowledge transfer. This trend is likely to continue over the next 100 years. Moreover, gender differences and social attitudes will undergo many important changes, so the question of separating the sexes in school will disappear. Social attitudes will be shaped by creative and intellectual potential rather than gender, and education will play a major role in this process. Career prospects and professional development will also be less dependent on gender differences. Education is a means of social mobility and brings to naught class privileges, irrespective of gender.

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We can assert with certainty that modern schooling has shifted and now focuses mainly on developing students' research skills. Its task is to teach systematic learning as well as independence and responsibility. However, not all education systems across different countries have undergone such a shift. For example, Russian schools with few exceptions focus on teaching subject knowledge, much of which is subsequently underutilized. In teaching subject knowledge, the system is quite effective. 4th and the 8th grade students show excellent results in mathematics and natural science literacy (The International Association for the Evaluation of Educational Achievement, IEA;[6] Centre for Education Quality Assessment of the Institute of Content and Teaching Methods of the Russian Academy of Education).[7] But when it comes down to demonstrating the ability to apply knowledge in real-life situations, our students run second to their foreign peers. That is why the PISA testing (the Program for International Student Assessment which is carried out every three years and that tests 15-year-olds, regardless of the type of educational

institution) continually places Russia in the group of countries with below average results. The countries that have made a shift towards research competency, independent decision-making and personal involvement in choosing educational paths achieve the best results in this international ranking.[8] Given that the development and introduction of new educational solutions based on new technologies takes about 40–50 years, we have reason to assume that in 100 years the shift towards the formation of research competencies will continue. The obvious leader in education today is Singapore, and its experts claim that it took 45 years to develop the current educational system. Only now is it yielding brilliant results, which Singaporean students have been consistently demonstrating over the past 10 years of international studies.

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Higher Education: the Triple Jump

By the end of the XIX century the Humboldt University model (academic freedom and the combination of teaching with research) became dominant around the world. The social role and the mission of universities of this type primarily consisted in maintaining and transmitting a system of values. Starting from the 1920s, the world has gradually been moving away from this system. Once unregulated in Humboldt model, scientific research is now harnessed for advancing technology, including increasing security protection. Due to the challenges of contemporary society, developing an individual's creative potential is an essential precondition for a successful career. Apart from purely professional knowledge, such universal management skills are growing ever more important, such as the ability to work on projects, build teams, become a leader, and to search for and analyze information. This allows a person to be much more mobile in the labor market and move from one area to another.

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In 100 years education will help enable individuals to manage themselves, and this will become a key requirement. Self-management (as is meant by the development of independence and responsibility) implies the mastery of basic universal skills, namely regulatory, communicative, cognitive, and applied skills, that are utilized both during the period of education and in solving problems in real life situations.

Today we live in an information society. This is the society of expanding resources, including educational ones. The technologies for developing these resources have changed a lot and have become more complex. We suffer from information overload, from an inability to navigate a sea of information, to quickly analyze and extract information and to draw conclusions. Many employers complain of graduates' inability to make decisions even in routine, let alone non-routine situations, although they possess sufficient professional knowledge to do so.[9]

Education leaders agree that the current system of education is failing to promote such competencies as communication skills, the ability to work in a team towards common goals, to share responsibility, to trust leaders, to build relationships with peers and adults, and at the same time to identify leadership qualities and skills. Mastering such skills at university appears to be too late. These cross-cutting competences, as they are often referred to, should be developed through the entire system of education: early development, pre-school, primary school, vocational training, and higher education.

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In 100 years the "One-to-one" concept of education will become widespread around the world. Information resources make it possible for children to communicate with their peers and teachers, and not only study the subject at hand, but share the results of their individual or collective activities through project or research work as well as social practices. Indeed, one cannot achieve the mastery of all the knowledge in today's information world, but one should possess the skills and the ability to learn and develop professionally. In 100 years the system of education will concentrate resources on helping individuals on a permanent basis become responsible and self-reliant adults, able to solve life's problems. It is important to form and maintain individual motivation and incentive to continue their education.

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Therefore, I believe that in 100 years the new model of education will place the main emphasis on freedom, on rendering professional guidance from teachers aimed at facilitating children's imagination, and on inculcating the social skills to express it publicly. These developments will fundamentally change the concept of education from the oppressive model (which Michel Foucault described as the "supervise and punish" system)[10] to a creative one. Creativity is a special dimension and its formation requires special conditions, above all, the freedom of creative exploration, research, i.e. freedom to think, to design, to try, and to make mistakes. In 100 years the creative model of education will be characterized by a cluster rather than departmental organization. It will be a model of cooperation of independent schools, universities, foundations, non-profit organizations and commercial companies, linked by collaboration and competition, and often sharing a common location. The foundations of creativity in the changing global world are as follows:

- multicultural environment and tolerance;
- leaders and leadership;
- new management technologies;
- creative initiative, cultural traditions and the ability to reproduce both;
- reproduction and the commercial use of resources;
- skills for engaging in constructive dialogue;
- project ideology.

It is important that professional educators assist in all of these aspects. We need competent and intelligent interactions between families, parents, teachers, and organizations that are working with children and are good at establishing contacts with them, namely centres for psychological, educational and social support. Today children learn to use gadgets before they learn to speak. It is important to prevent them from being overloaded at such an early age, which requires maintaining close proximity over a child at all times. In 100 years the basic features of education will involve promoting assistance and cooperation between children and adults as well as between children. The principles that lay the foundation for such assistance require the competence and professional development of teachers *prima facie*.

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Multicultural development is another intrinsic feature of the education model in 100 years, without which the latter seems highly flawed. This type of education implies a profound learning of culture not only through one's native language, but also through a system of cooperating actions, including the organization of holidays and ceremonies, wearing costumes, and a familiarization with traditional cuisine. The preservation of national traditions and living languages, woven into the fabric of life, is of paramount importance for education, since it preserves the wealth of culture as well as improves people's tolerant attitudes all their lives.

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One international study of the information competence of teachers of natural science, mathematics and informatics (CITES – comparative IT education study) had the following question: "How much time do you spend with students over social networks and e-mail correspondence outside the classroom and school?" Most Russian respondents admitted that they didn't do so at all, while in other countries, such as Norway, up to 92% of teachers communicated with their pupils outside of class. The teacher becomes a partner in life and discusses both classes and life problems with students. Partnerships between students and teachers are an integral part of creative education. There is hope that this type of relationship will prevail in 100 years.

Meanwhile, museums, libraries or theaters, sports or cultural events represent different environments in which children can thrive. The education system should ensure their diversity and permanent, so that children can learn how to take advantage of them. Education in 100 years will have at its disposal different formats for aiding children in sports or arts. The aim should be to help children in their process of self-identification and help them understand the scope of interests that they would like to pursue in the future.

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Education in the future will utilize management practices that are activity-oriented and create the future in the present. This is referred to as action-education and action-research. To this end, educational institutions should certainly have the right to focus and reallocate resources, as well as possess the know-how for achieving results. This does not interfere with the principles of transparent budgeting and public accountability. On the contrary, these processes make the use of such mechanisms more efficient. In the future the key organizers of education will be institutions that carry out the following three types of processes simultaneously:

- development of educational technologies that integrate project and research tasks into the overall educational process;
- development of projects related to developing various technologies;
- fundamental and applied research.

The effective combination of all the three processes in creating and renewing educational programmes will ensure their competitiveness in future.

There is hope that the movement of edutainment that is gaining momentum will help return games and sports to education. There is reason to believe that education in 100 years will be focused on preserving and developing interest and motivation, based on self-management. Information and Communication Technologies will make it possible for people, who independently develop their own educational programmes, to identify their abilities and potential, as well as certain weaknesses. Every person will be able to test himself, understand what is happening to him or her, and make decisions. There is little doubt, that in the future such technologies will be developed and provided to educational institutions so that they can teach children free of charge to use it privately. Thus, children will learn how to bear responsibility for themselves and their health as well as their physical, mental and emotional state, and will acquire the skills to handle crises.

NOTES

[1] *Richard Florida.* Creative class: People who change the future. Moscow, Classic-XXI Publishers, 2011. P. 432.

[2] Education at a Glance: OECD Indicators. 2013.
URL: http://www.oecd-ilibrary.org/education/education-at-a-glance-2013_eag-2013-en

[3] The normative need of citizens of the Russian Federation in social infrastructure facilities is determined in accordance with methodology established by Regulation No 1683-p of October 19, 1999 (as amended by Regulation No. 1767-p of November 23, 2009). The standards are set for providing 60% of children of the appropriate age in urban areas and 40% of them in rural areas with preschool education opportunities.

[4] *Heckman J.J.* Policies to Foster Human Capital // Research in Economics. 2000. Vol. 54 (1). P. 3–56.

[5] *Zigler E.* Reshaping Early Childhood Intervention to Be a More Effective Weapon Against Poverty // American Journal of Community Psychology. 1994. Vol. 22 (1). P. 37–47; *Lally J., Mangione P., Honig A.* The Syracuse University Family Development Research Program: Long-Range Impact on an Early Intervention With Low-Income Children and Their Families // Powell D. (ed.) Parent Education as Early Childhood Intervention. Norwood: Ablex, 1988. P. 79–104.

[6] TIMSS and PIRLS International Study Center. URL: http://timssandpirls.bc.edu/

[7] Ministry of Education and Science of the Russian Federation/Institute for Strategy of Education Development of the Russian Academy of Education (ISED RAE). ISED RAE Center for Education Quality Assessment. URL: http://www.centeroko.ru/

[8] OECD Programme For International Student Assessment (PISA). 2012. URL: http://pisa2012.acer.edu.au/. OECD PISA in Focus. June, 2014. URL: http://www.oecd.org/pisa/pisaproducts/pisainfocus/pisa-in-focus-n40-%28eng%29-final.pdf

[9] OECD Economic Surveys: Russian Federation 2013. January 15, 2014. URL: http://www.oecd-ilibrary.org/economics/oecd-economic-surveys-russian-federation-2013_eco_surveys-rus-2013-en. Acemoglu D., Autor D. Skills, Tasks and Technologies: Implications for Employment and Earnings. NBER Working Paper No 16082. June 2010. URL: http://www.nber.org/papers/w16082

[10] *Michel Foucault.* Surveiller et punir, naissance de la prison. Paris, Gallimard, 1975.