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Table of contents

No 3, 2017

THEORETICAL AND APPLIED RESEARCH

Simon Marginson

The Public Good Created by Higher Education
Institutions in Russia 8

**Elena Chernova, Tite Akhobadze,
Aleksandra Malova, Andrey Saltan**

Higher Education Funding Models and Institutional
Effectiveness: *Empirical Research of European Experience
and Russian Trends* 37

Alexey Bessudnov, Dmitry Kurakin, Valeriya Malik

The Myth about Universal Higher Education:
Russia in the International Context 83

PRACTICE

**Filipp Kazin, Stephen Hagen,
Anastasiya Prichislenko, Andrey Zlenko**

Developing the Entrepreneurial University through Positive
Psychology and Social Enterprise 110

Irina Abramova, Elena Shishmolina

Modeling a Foreign-Language Environment When Teaching
Non-Linguistic Students: Preliminary Results 132

EDUCATION STATISTICS AND SOCIOLOGY

Galina Cherednichenko

Russian Youth in the Education System:
From Stage to Stage 152

**Daniil Alexandrov, Valeria Ivaniushina,
Dmitry Simanovsky**

Online Educational Resources
for Schoolchildren and the Digital Divide 183

DISCUSSION

Yaroslav Kuzminov, Dmitry Peskov

Discussion “What Tomorrow Holds for Universities”

Moscow, HSE, July 14, 2017 202

BOOK REVIEWS AND SURVEY ARTICLES

Lev Lyubimov

The Book that Every School Needs

Review of the Russian Edition of the Book: Leontiev A. Pedagogy of Common Sense. Selected Works on Philosophy of Education and Educational Psychology

232

Gasán Guseynov

How to Avoid Predicaments in Human Improvement

Review of the Russian Edition of the Book: Cohen D. K.

Teaching and Its Predicaments 240

REFLECTIONS ON...

Alexander Chepurenko

How and Why Entrepreneurship Should Be Taught to

Students: Polemical Notes 248

The Public Good Created by Higher Education Institutions in Russia

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Abstract. The public/private distinction is central to higher education but there is no consensus on the meaning of 'public'. Two different meanings are in use. Economic theory distinguishes non market goods (public) that cannot be produced for profit, from market-based activity (private). This provides a basis for identifying the minimum necessary public expenditure, but does not effectively encompass collective goods. In political theory 'public' is often understood as state ownership and/or control. This is more inclusive than the economic definition, and recognizes the scope for norms and policies, but lacks clear boundaries. The first part of the article synthesizes these two approaches, developing an analytical framework with four quadrants (civil society, social democracy, state quasi-market, commercial market) that can be used to categorise activities in higher education and re-

search. The second part summarises the findings of 30 semi-structured interviews in the Russian government and two universities, conducted in 2013, concerning perceptions of public goods produced in Russian higher education. While most interviewees saw research as a global public good, they were divided in relation to teaching and learning. Some understood the education function as a public good in both the economic and political sense and wanted the government to take greater responsibility for improvement in higher education. Others saw higher education as a private good in the economic sense, and while they acknowledged the need for government because of market failure, wanted public intervention and regulation to be reduced. This division in thought about public/private paralleled the larger division between Soviet and neoliberal thinking in the Russian polity, and also the divided character of higher education, which is evenly split between free government administered places and a fee-paying student market.

Keywords. Higher education, Funding of education, Public good, Private benefit, University mission, Paul Samuelson, John Dewey, Russia.

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1. Introduction: Problems of public/private

Ideas about 'public' and 'private' are central to thinking about higher education policy. But in the policy space these terms are used in a variety of ways to promote different and conflicting agendas. In the process, meanings have become confused, if not distorted. It would be good if social science provided greater clarity, allowing the policy de-

bate to be sorted, but it does not. Social science meanings of public/private in higher education also vary. There is little consensus or understanding about two aspects of public/private in higher education.

First, there is no agreement about where the public/private line falls. There are two main concepts of public/private. In one approach, which can be called the economic definition, public/private is understood as a distinction between non-market production in higher education, and market or commercial production of higher education. In the other approach, which can be called the political definition, public/private is understood as a distinction between state-controlled higher education and non-state-controlled higher education.

Each of these definitions is useful up to a point. Each contains something important. However, they are not the same. They overlap in relation to the role of government. Nevertheless they are distinct, the overlap is not complete. This is where misunderstandings occur. Some see the public/private distinction as an opposition between state and market. This takes 'public' from the political definition and 'market' from the economic definition, and divides the world between them. But this leads to an incoherent picture of reality. States use markets to achieve some policy goals—there can be state controlled market production. In those circumstances, state and market are not opposed to each other. Conversely, some higher education is both non-state and non-market in character, such as philanthropically financed education. That falls right outside a state/market division of the world.

Second, understandings of 'public goods' and the combined 'public good' in higher education are blurred. Most people understand private goods that are associated with higher education, such as the contribution of degrees to additional earnings and better employment rates. It is not always clear whether the rates of return to degrees are driven by the education, or by other factors such as family background or social networks, but there are commonly understood definitions and measures of these private goods. However, there is no common understanding of agreement about definitions and measures of the public goods contributed by higher education. Opinions differ from expert to expert and country to country. Mostly the scholarly work consists of opinions. Empirical studies of public goods in higher education are under-developed. Even in studies where empirical observations are used (see the review of such studies by [McMahon, 2009]) findings tend to be shaped by scholars' prior assumptions.

There are special difficulties in dealing with the collective aspect of public goods, those outcomes of higher education which do not consist of individual benefits but affect the quality of relational society—for example the shared social and scientific literacy enabled by higher education, the increase in combined productivity at work, the contributions of higher education to furthering social tolerance and international understanding, and the role of higher education in increasing

This article is a revised version of a paper delivered at the conference on 'University between Global Challenges and Local Commitments', National Research University Higher School of Economics, VII International Conference, Moscow 20–22 October 2016. Anna Smolentseva, Nelly Pavlova and Isak Froumin provided indispensable assistance during the 2013 interviews reported in the second half of the article. Thanks also to Vera Arbieva.

the combined capacity of a society to deal with change and modernisation. Because a common understanding of collective public goods in higher education is lacking, these goods tend to be under-provided and under-financed, including those public goods that are global not national in character, in that they flow across borders.

There is also no clarity on whether the public goods produced by universities and other higher education institutions are alternatives to the private goods, so that higher education produces *either* private goods or public goods and the relationship between them is zero-sum, or the public goods and private goods are positive-sum and tend to increase together.

1.1. Content of this article

The article that follows will address these issues—the economic definition and the political definition, collective public goods, and whether public goods in higher education are zero sum (either/or) in relation to private goods, or positive sum. The first half of the article presents a new approach to public and private goods in higher education, first published a year ago, that combines the economic and political definitions [Marginson, 2016a].

However, ideas and practices of ‘public’ and ‘private’ in higher education are not the same everywhere in the world. The ideas and practices associated with ‘public’ in higher education vary between countries, on the basis of differences in political culture and in the conventions governing the relations between the nation-state and higher education. What is ‘public’ in higher education in some countries can be ‘private’ in others. It would be better if there was a common set of activities everywhere understood as ‘public’, a generic notion of ‘public’, but that does not really exist. The author is presently working on an eight-country study of concepts, definitions and measures of ‘public’ and ‘public goods’ in higher education that is aimed at finding what common ground if any might exist between the different national traditions and approaches to this problem. The eight countries in the study are Russia and Australia, where interviews were conducted in 2013, and UK, USA, France, Finland, China and Japan where interviews will take place in 2017 and 2018. (It is possible that the research inquiry will be extended also to Chile or Mexico, and to Germany).

The second half of the article presents the first findings from 30 interviews in Russia in 2013, in the government and in two contrasting higher education institutions. Interviewees had much to say about what in their opinion were public goods in higher education. Their ideas about public/private reflected two different and conflicting approaches to the problem

2. A new approach to public/private

2.1. The economic definition

As noted, the economic definition of public/private rests on the distinction between production for profit in a buyer/seller market (private goods) and all other production (public goods). This distinction can be traced to an influential article by Paul Samuelson [1954] on 'The pure theory of public expenditure'. For Samuelson, production and exchange in a market was the normal form of economic production, except for certain kinds of goods that were socially necessary but could not be produced on a profit-making basis. These goods could not be produced in a market because they are non-rivalrous and/or non-excludable.

Goods are non-rivalrous when they can be consumed by any number of people without being depleted, for example knowledge of a mathematical theorem, which sustains its use value indefinitely on the basis of free access [Stiglitz, 1999]. Goods are non-excludable when the benefits cannot be confined to individual buyers, such as clean air regulation, or national defence. Private goods are neither non-rivalrous nor non-excludable. They can be produced, packaged and sold as individualised commodities in markets. Public goods and part-public goods require government funding or philanthropic support. They do not necessarily require full government financing, and can be produced in either state or private institutions.

Not all public goods are deliberately produced by government on a basis separate from markets. Economists identify 'spillover' public goods, or 'externalities', additional to the private goods, such as the contribution of educational courses that create private benefits for individuals (such as positional advantage in the labour markets) to the creation of attributes in those same individuals that are of relational public benefit, such as tolerance or literacy. The individual capacity to use information and communications technologies can be measured—it is an area where graduates do distinctly better than non-graduates [OECD, 2015: 46–47]—but arguably, the benefit is not simply for the individual but for collective relations, as communications technologies sustain large active relational networks. The orthodox economic assumption here is that the core production is market production and the spillovers arise as unintended consequences of the production of private goods. However, it is not quite that simple, because in some cases 'externalities' from the production of private goods in higher education might be deliberate objectives of government (for example, the capability of graduates in handling new technologies, or their international competences) and this might be one of the purposes of government funding of higher education. In that case, the 'externalities' might be part of the core purpose of both higher education, and the government organisation and funding of it, so they are more internal than external to the core activity.

The economic definition is useful because it identifies the minimum necessary government action and financing. On the other hand, the notion is also ideologically loaded. Many would disagree that it is

normal or desirable for goods to be produced in a market unless that is impossible. Markets can change the character of the product, and stratify value and distribution. They generate tendencies to concentration and monopoly and over time are associated with growing inequalities in incomes and consumption unless there is state intervention to correct the tendency to inequality. On the other hand, state modification of market production to enhance externalities has the potential to reduce these negative effects. Hence there are two ways to expand public goods in higher education by state action—direct non-market production, and public regulation and subsidy of production in the market.

While Samuelson's economic distinction is naturalistic, in that it implies that public or private is determined by the nature of the goods—naturally rivalrous and excludable or not—public/private in higher education can also be a matter of deliberate policy choice. On one hand, there are natural public goods in this sector. Research is a natural public good, as in the case of the mathematical theorem. Even though newly discovered research can be rendered a temporary private good through patents or copyrights, enabling its creator to secure a financial advantage, once the knowledge is made public it can be freely accessed, copied and used. On the other hand, teaching/learning is both a private and a public good and can be produced in a wide variety of ways with differing public/private balances. The public goods arising in teaching and learning include learned knowledge, which is non-excludable and non-rivalrous. Private goods arise in all teaching/learning that provides the graduate with an individual advantage when compared to non-graduates. If the degree provides labour market advantages, and places in the teaching program are subject to scarcity, there is rivalry. In universities with a surplus of applications over places, participation is excludable.

When there is potential private good production, a market in tuition can be created, though not all nations choose to do so. The potential value of such private goods, even in public, state-owned universities, is maximized where students can enter valuable positional opportunities in elite universities that lead to high income high status careers in, say, Law.

2.2. The political definition

The Samuelson definition treats the state as essentially outside the market economy and only brought into the picture when absolutely necessary. This is not a good description of how any society, or higher education system, actually works. The state is more important than such a minimalist approach would suggest. This brings the political definition of public/private into the picture. This is the distinction between matters that are seen as public in the sense that they are ultimately shaped by government and the political and policy processes,

and matters that are seen as private and confined to the commercial market, the family or civil society.

John Dewey [1927] provides one explanation of the public/private boundary in the political sense. His public/private is the distinction between matters of state, and other matters. In this definition, 'public' higher education is not confined only to institutions or activities that are directly government provided or financed. 'Public' in the political sense refers to any matter taken by the state as a deliberative actor with policy goals. Matters that are public in the economic sense are usually public in this political sense too, but so are many other matters. Governments often use private and semi-public agencies to achieve their goals.

'Public' includes the kind of state intervention to regulate economic markets and private firms that goes beyond simply providing a stable legal framework for markets. Note here the state is closely involved in higher education, in many domains, in all countries. Higher education does not necessarily stop being 'public' in this political sense when there is competition between institutions, and high tuition fees are charged. It is true that some market production is fully deregulated and belongs in the private political sphere, even in higher education, such as certain for-profit colleges, and commercial research and consultancy. But most production that involves competition and perhaps tuition fees occurs in the public sector or takes place in private institutions subject to close regulation.

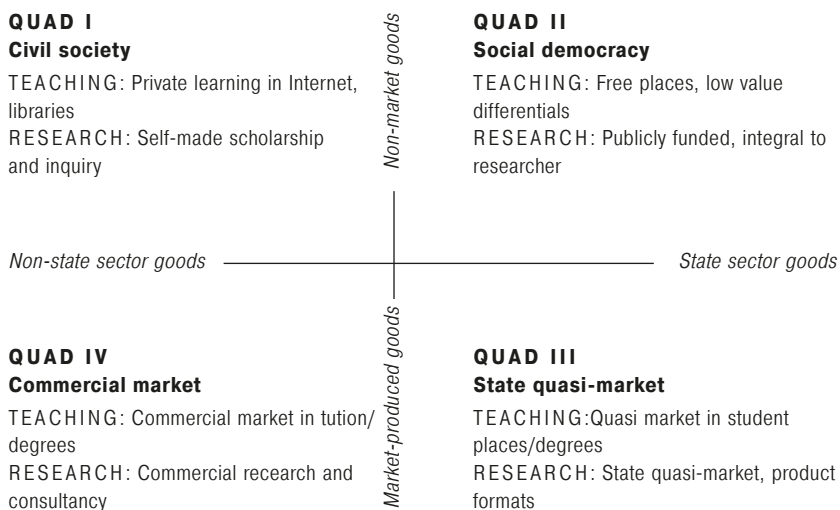
2.3. Public and private goods in higher education: The four variations

How then can the economic definition of public/private be reconciled with the political definition of public/private? It is worth trying to reconcile them, rather than doing what most social scientists do, and that is choosing one or the other. This is because both definitions can contribute to better policy and practice. For example, each can be used to test practices arising from the other. The economic definition, based on the non-market/market distinction, can be used to subject politically-defined public goods to tests of limited resources and costs. 'How publicly generous should higher education provision be?' asks the economist. Conversely, the political definition of public/private, based on the state/non-state distinction, can subject economically-defined public and private goods to tests of values, norms, social relations and system design. 'Public and collective forms of provision can change the nature of the goods, for example their social equity', it says. 'What kind of society do you want?' The response to that from the economic side is: 'To the extent your preferred social arrangement is subject to market failure and government finances it. Is it affordable?'

But nevertheless, having two separate definitions without resolution creates ambiguity and confusion. How then can we adopt a coherent approach to public/private? This can be done by combining the

Figure 1. **Combining the economic and political definitions of public/private goods in higher education: Four Quadrants, four political economies of higher education**

PUBLIC AND PRIVATE GOODS: THE FOUR VARIATIONS



Note. State, institutions and individuals are active agents in all four quadrants.
Source: author.

two public/private definitions in a matrix (see Figure 1). This replaces what is an ambiguous two-way distinction between public and private elements in higher education and research, with four distinct zones, four different political economies of higher education, in which higher education and research are practiced in clearly contrasting ways.

The economic and political definitions derive from philosophically distinct standpoints. The economic definition is procedural. Matters are defined as private or public according to assumptions about the proper conduct of, and a division of labour between, market and public activity. The more eclectic, open and variable political definition is consequential. Matters are defined as private or public according to their outcomes and effects, including the effects of making them public. Arguably, neither a procedural nor a consequential strategy is sufficient in itself; both, when singly relied on, lead to errors and excesses; and each serves as a check on the other. Arguably, in social institutions such as higher education, combining the two distinctive definitions into a hybrid form provides conditions for optimality.

Quadrant 1 (Civil society) is a non-market private zone in which free teaching and research are practiced as ends in themselves, at home or university, without government supervision or close institutional management. Much learning and discovery takes this form,

more than is usually realized, precisely because it is unregulated. The state is not entirely absent in that it regulates civil conduct and the family in the legal sense.

In *Quadrant 2 (Social democracy)* production takes a non-market form—for example the free student places or low fee places in most of Europe—while also being regulated directly by government. Much research activity is concentrated in Quadrant 2.

In *Quadrant 3 (state quasi-market)* government still shapes what happens in higher education, but it uses market-like forms to achieve its objectives, and encourages universities to operate as corporations—with significant tuition fees, systems organised on the basis of students as ‘customers’ not learners, competition between universities for funds, and product-style research formats. This is the higher education sector imagined by global rankings, higher education as a managed market. Marketization reforms in many countries, including the English speaking nations and Russia, have pushed an increasing part of higher education activity into Quadrant 3, much more so than into the pure commercial market in Quadrant 4.

In *Quadrant 4 (commercial market)*, higher education becomes a fully-developed profit-making industry under private ownership. The government regulates the market as it regulates all commerce, by providing a legal framework, but it does not intervene more closely. Courses in higher education that operate on the deregulated basis of full-price fees and an unlimited number of student places are in Quadrant 4, for example international education and professional training in some countries, and the fee-based programs introduced in Russia in the 1990s. However, in most systems pure market forms in Quadrant 4 are overshadowed by the volume of activity in Quadrants 2 and 3.

Real life higher education systems mix activity in all four Quadrants but the balance varies. Nordic and Central European systems are strong in Quadrant 2. The competitive Anglo-American systems are pulling ever more activity into the quasi-markets in Quadrant 3. The four Quadrants show there is nothing inevitable about inherited arrangements. Governments and societies can order their systems as they want. The diagram also shows that there is great scope for producing public goods in higher education, through government leadership in Quadrants 2 and 3, civil and community-based organisation in Quadrant 1, or self-regulating higher education institutions themselves in all three of Quadrants 1, 2 and 3. The ‘pure’ public good Quadrant is Quadrant 2 where production is public in both the sense of non-market and the sense of state control. The pure private Quadrant is Quadrant 4.

2.4. Common goods in higher education The fact that higher education is ‘public’ does not mean that in some way it is better or more desirable. Both public in the economic sense, and public in the political sense, can be associated with a very wide

range of normative policy practices. For example, in elite universities public goods in the economic sense can become captured by the most influential families, as is the case with highly selective public universities in countries where tuition is free. Some public goods in the political sense benefit powerful interests able to influence the state to work on their behalf, or a state may use its power to create public goods to establish a globally aggressive military that creates public 'bads' for the population of other countries.

However, there are some public goods—in one or both senses—that benefit populations broadly. For example, public programs that help to build relational society (sociability), and sustain inclusive and rights-based human relations. These goods can be called 'common goods'. They include higher education to the extent that it fosters an equitable framework of social opportunity, offers good quality mass higher education, strengthens society in regions and provincial centres, and provides relational collective goods such as tolerance, cross-border international understanding and accessible knowledge. Equal social opportunity in and through higher education is perhaps the most important of such common goods.

2.5. Global public goods

There is one other kind of public good in higher education and research that also deserves specific mention. Some public goods are produced in the absence of a state, in the global sphere of activity. For example, research knowledge is subject to extensive cross-border teamwork and exchange and much of it is produced beyond the effective supervision of any national government. Technically, in the global sphere only one public/private distinction can be relevant, the economic distinction as outlined by Samuelson [1954]. No doubt the absence of the political factor leads to under-recognition of the contribution of higher education in producing global public goods, and hence their underfunding and under-provision.

According to the UNDP, global public goods are 'goods that have a significant element of non-rivalry and/or non-excludability and are made broadly available across populations on a global scale. They affect more than one group of countries'. One global public good is research knowledge. However, nations differ in the extent to which they contribute to and benefit from global public goods that are carried by cross-border flows of knowledge, ideas and people and generated in education and research. For example, the content of global knowledge flows is linguistically and culturally dominated by certain countries, especially the United States. This raises a question of 'whose public goods?' For faculty whose first language is Russian, having English as the single common global language is a public good in the sense that it facilitates global communication and sharing, but a 'public bad' (a negative global public good) to the extent that it marginalises knowledge in Russian language at a global level, and deval-

ues Russian at home, for example in local science communities. Net brain drain of research personnel to other countries is another kind of global public bad.

3. Public goods in higher education in Russia

As noted, countries vary in political culture. For example, there are differences between them in how broad the reach of the state is—whether its responsibilities are seen as comprehensive to the whole society, or limited [Marginson, 2016b: 119–125]. The Anglo-American or English-speaking country tradition is that of a limited liberal state, with separation and division of powers between elected government, bureaucracy, judiciary, private markets and civil society. In Anglo-American polities, there is always tension on the boundary between government and other sectors. The legitimacy of government actions is constantly scrutinised. Higher education is not seen as part of the state, it is positioned somewhere between government and civil society. In contrast, in both the Nordic countries and East Asia, while certain sectors exercise partial autonomy, the role and responsibilities of the state are understood as across society. Some argue that ‘state’ and ‘society’ are identical. Higher education is normally seen as part of the state, though HEIs have partial autonomy. This might be called the comprehensive state. Nordic and East Asian practices differ in certain ways—for example Nordic countries take a more state-centred approach to welfare and health care while in East Asia the family has a larger role in these domains. Likewise, while in East Asia families share the costs of providing education with government, in Nordic countries there is a strong tradition of tuition-free higher education [Valimaa, 2011]. Countries also vary in how egalitarian the higher education system is expected to be, with the Nordic countries perhaps more determined than others to establish equality of opportunity in higher education. Russia has another kind of comprehensive state tradition, in which the state maintains control and reserves the right to intervene, but is not itself a Nordic-style provider.

These differences influence political understandings of public, or private, in all sectors, and the way the economic distinction between public and private is interpreted by policy makers. Such differences can affect the quadrant locations of production in higher education.

The article will now consider how Russian interviewees saw the public/private distinction, and the roles and responsibilities of government, in higher education. The data were gathered in 2013 with assistance from the Institute of Education at the National Research University, Higher School of Economics, whose personnel arranged most of the research interviews and in some of the interviews assisted with interpreting. The interviews were all conducted in Moscow. Interviewees included five government personnel responsible for higher education matters; eight interviews in the National University of Science and Technology, MISIS (2017), an engineering university specialising

in metallurgy; and 17 interviews at HSE (2017). The HSE interviews included faculty from social science, humanities, mathematics and engineering, and university leaders and administrators.

3.1. Economic public goods in higher education: Individualised

During the interviews, most interviewees stated that higher education contributed to a broad range of non-market goods, 'public goods' in terms of a Samuelson economic definition. This discussion centred on the two kinds of non-market public goods in the economic sense— (a) individualised public goods, attributes of graduates not specifically rewarded in the labour markets, in the form of personal qualities that students acquired in the course of their education; and (b) collective goods, outcomes of higher education not manifest in individual attributes (logically akin to, say, national defence), that contributed to a better society. The standard economic paradigm has difficulty in modelling collective goods, and tends to rely solely on the notion of aggregated spillovers from private goods. But that misses the relational dimension, those social forms which arise not from one a-tarkic individual or another in a methodologically individual universe [Lukes, 1973] but arise from people's relationships. One HSE executive pushed towards the limits of orthodox economics:

'... is there a direct public good that goes not through individuals? The idea of university as a public good is that individuals get knowledge and become more productive and then, in addition to the individual rate of return, there is a social rate of return. They pay higher taxes, they live longer. Fine. But the interesting question is, do the universities do something directly for the public, not through this social rate of return through the taxes and productivity?' (HSE executive)

These two categories (a) and (b) shaded into each other when the formation of individual students/graduates in HEIs was being discussed. Hence when students learnt to become more tolerant or more technologically competent, together they generated a more tolerant society, and a society more sophisticated in communications and technically competent at work. One interviewee emphasised the role of higher education in fostering intellectually critical thought. This was said to improve capability understanding of oneself and one's own culture, and that in turn could lead to the development of better cross-cultural skills. Several interviewees, especially at MISIS, discussed the contribution of higher education institutions in building greater tolerance between people from different backgrounds or regions. "We must live together as brothers or perish together as fools", as one put it.

3.2. Economic public goods in higher education: Collective There was a wide-ranging and often detailed discussion by many interviewees of the role of higher education in creating collective characteristics of society. Some emphasised that this role was holistic and impossible to fully and satisfactorily measure in terms of specific outcomes. ‘You cannot divide an ocean by parts’ said an HSE historian. Much of this kind of discussion was about higher education’s contributions to knowledge and intellectual culture. Some of this discussion referred to long-standing notions of public culture from the Soviet period, in which knowledge generated in universities was seen as a communal resource. Several interviewees noted the role of HEIs in providing publicly available expertise in all disciplines, and as an open source of information and ideas, and improvements in cultural life, a resource almost akin to a society-wide library or museum. An officer in HSE international programs stated ‘I think the university, it’s like a fjord inside of society’. In many interviews this public role of higher education in knowledge and communications was explicitly grounded in the ‘public good’ nature of knowledge. For example, the same HSE historian referred to ‘knowledge, which is certainly public’. Another interviewee reflected on ‘the sociability of knowledge’. For some lifting the common literacy was a vital function of educational institutions, especially outside the major cities.

Interviewees also referred to the contribution of higher education to social and economic modernisation. However, it was striking that there was not much discussion of either the role of higher education in fostering national economic competitiveness—though that role is a public good in both the economic and the political sense—or in providing for economic prosperity, except indirectly, in terms of the preparation of graduates for work. The economic contribution of higher education to capital, profit and aggregated national product was seen as separate from the public goods agenda, as a kind of outgrowth of the role of higher education in generating private economic goods for graduates, but not a public property.

Several people argued that government should guarantee human rights as a common good and that one of the essential roles of government was to ensure that students from all backgrounds had opportunities to enter higher education. There was also some discussion of higher education’s role in fostering social mobility, for example by providing opportunities for students from poorer families, though not as much discussion as might be expected, and occurs in other national contexts. It is likely that this was because in the minds of the majority of interviewees, the broad extension of access had become associated with negative ‘public bads’ in the form of debasement of the quality of mass higher education.

3.3. Collective ‘public bad’ in higher education Many interviewees criticised the emptying out of substance in mass education, arguing that much of Russian higher education had be-

come reduced to credentials of low value with little being learned. These issues were deeply felt. Though there was no question specifically on the topic, it arose during the majority of interviews, and often led to lengthy statements. Both government and university interviewees took up this theme:

'There are too many people with higher education from our point of view... many people who have a higher education degree go to work in jobs which do not require this degree' (government official).

'The diploma of higher education became mostly a piece of paper which doesn't guarantee that any knowledge can be behind it... we need to regain the status of higher education credentials' (MISIS engineering faculty and planner).

Russia's relatively high level of participation was a long-standing feature of Soviet higher education and became more so of the post-Soviet period, with the doubling of the participation rate in the 1990s. At that time all forms of education were severely under-funded and this has become definitive of mass higher education, which in the minds of most interviewees was firmly associated with poor quality, credentialism and low levels of learning. Some interviewees described a two track higher education system. 'The economy does not consume all the graduates... for socialisation and citizenship, that's a larger function', said one government official. As an HSE sociologist put it, 'we have actually many graduates with very high self-efficacy but very low level of real skills'. In the first track, graduates had learned something, they were more or less adequately prepared for work and there were useful places for them in the labour markets. In the other track, students acquired generic skills such as communication, and personal confidence, and a credential of little meaning in terms of vocational preparedness, but for many these qualities were undercut by the low level of educational provision and paucity of learning. It is significant that the discussion normed higher education in terms of a human capital paradigm—the second track function was described by several as 'socialisation'. In most (not all) cases the implication was that this was a low grade education, an inferior substitute to proper preparation for work. This suggests that the many statements about the public good functions of higher education, its role in generating relational citizens, were less deeply rooted than they seemed. These attributes were negatively referenced in the deeply felt critiques of mass higher education.

However, it was not very clear whether the problem was seen as (1) giving too many students higher education, to the point that access had been extended to some people that could not learn effectively, (2) giving higher education to more graduates than the labour market could provide with value-adding jobs, or (3) the provision in

Russia of low grade unfunded mass higher education that could never create public or private goods of value, regardless of the level of participation. Perhaps within this jumbled logic, the possibility remained of a higher quality 'socialisation' stream which would generate public benefits that would be valued by all. But these three kinds of points were often mixed in together. Interestingly, low private returns to graduates were the most cited symptom of the combined failings of the system. In most people's minds, private goods were the lynchpin of valuation.

Some said that it should be a mandatory responsibility of the government to monitor, improve and manage standards of curriculum and student learning. Two HSE interviewees, who were reluctant to increase the role of government in the sector, instead placed the emphasis on better regulation by professional associations.

3.4. Measuring and financing economic public goods

It was noted by several that the public goods produced in higher education were not a constant, but varied by time and place, and probably also varied by discipline, and by the size of the institution, and whether it had large-scale research. Several thought that there was possibly greater potential for public goods in the regions—or at least that the contribution of individual institutions to society and local economy was more obvious in regions than in Moscow. Several HSE interviewees discussed the role of HSE in government policy making and consultancy advice, though it was noted that this role was not open to all universities.

One would not expect interviewees to come up with firm and cogent proposals for the measurement of public goods in higher education, given the absence of tools for that purpose. 'I don't think there are any convincing measures of the impact of education on society, but everybody believes that there are' (HSE economist). However, while the MISIS interviewees were not greatly interested in the question of observation and measurement of these public goods, several HSE interviewees had ideas. Most of those ideas centred on tracking and measuring the purported impact of higher education on graduate skills, personality, values and career successes—in other words, they envisioned a closer assessment of the effects of higher education on both individualised public good spillovers and private goods. Some, as noted, focused on the greater tolerance exhibited by graduates compared to non-graduates, or mentioned higher education's contribution to the better health outcomes of graduates compared to non-graduates, a finding of research into higher education outcomes (McMahon, 2009). The MISIS interviewees were especially interested in tracing the contribution of MISIS graduates to government, society and economy as evidenced by their roles in leadership positions in the different sectors in Russia. Elite graduates form an important part of MISIS marketing. While these graduates achieve substantial private

goods, in the form of status and often of income, arguably the higher education system contributes to the collective public good through the functions of leadership selection and training.

The main challenge to measurement is the tracking of the larger collective goods. Perhaps qualities such as knowledge flows, tolerance and social equity in higher education can be tracked and measured only in part, using single indicators, rather than in a holistic manner. The interviewees had no strong suggestions to make in relation to these areas.

When discussing the financing of public goods, interviewees made the point that some public goods such as museums were not free. Several pointed out that strictly, higher education has never been free, given that either student/family or taxpayer/government have to pay for it. A couple of interviewees remarked that public goods are created in higher education as spillovers, whether or not tuition fees are charged, though there was also awareness that the incidence and nature of certain public goods are reduced by fees. When asked whether the public/private split in financing of higher education should be based on the public/private ratio of benefits, most demurred, and there was a good deal of scepticism about the strict use of Samuelson's definitions, especially during the discussion of collective public goods. However, two HSE economists firmly maintained the Samuelson approach.

3.5. Global and national public goods

Given that Russian higher education is not as internationalized as most Western European and East Asian systems, the emphasis on the global dimension, in some interviews, was perhaps surprising. 'It helps to globalise, to live in a more global world, to be more open and understand different cultures, to be engaged with other researchers and not reinvent the wheel', said one officer in HSE international programs. The globalist character of some of the interview conversation may reflect the strongly internationalized nature of HSE, in comparison with most HEIs in Russia. However, the discussion about public goods related to global relations and internationalization was almost entirely centred on knowledge exchange. Only one interviewee discussed teaching and learning, preparation for 'global citizenship'.

Discussion of knowledge as a public good led several interviewees to emphasize the global character of knowledge, its characteristics as a common human property that in both normative and practical terms could not be artificially confined to single nations:

'Let me tell you first of all, in my point of view, there is no Russian science or American science or Chinese science. It's world science... There is no national science, it's absurd' (HSE mathematician).

However, this was not universal practice in research. 'We have many, many articles in our journals. But they are not introduced into Web of Science. It's only Russian', noted one MISIS executive). Russian higher education and science has inherited the Soviet practice of limiting free international exchange and collaboration by taking in world science without opening up local science to the world, sealing off national scientific exchange by conducting it in Russian. The practice continues of translating global science at the border, and Russia is now almost unique in the degree to which research in sciences and technologies is in national language. One HSE executive noted that the typical reading of the global environment was not public collaboration and exchange but competition with other nations. Higher education was expected in Russia to contribute to the global position of the nation. 'Unfortunately, not many people within the university and within the government see internationalisation as a public good function. They see it as part of the global competition'. In the latter Russia has much in common with other countries, but other countries emphasize both competition and collaboration, at least in research. One HSE sociologist stated that 'never ever have I heard any kind of discussion at any university with which I was part of, [about] international production of public good'. An official working in a semi-government agency made the interesting comment that in the post-Soviet period Russia has become less global in outlook.

'Our contribution [to global public good] is not enough. It is not adequate to our possibilities and our potential, we could do more. Of course in Soviet time we were more evident, and more useful for the world, than right now' (public official).

From the national viewpoint, globalization had downsides as well as upsides. Several interviewees stated that Russia contributed to higher education in other countries through brain drain, a public good for other countries and a public bad for Russia. There were nationally-centred issues also in knowledge exchange, in which the distribution of costs was not necessarily the same as the distribution of benefits. The large research countries gave out more than they got back. 'Here of course we've run into the free rider problem, big time. One country pays and the whole world benefits' (HSE economist). But perhaps research nations gained soft power, if not global hegemony, by becoming providers of common knowledge. One HSE sociologist developed a lengthy critique of globalization as Americanization.

As this suggests, actual or potential tensions between global public goods and national public goods were an undercurrent in the interviews. At the same time, the university interviewees, especially at HSE, were on the whole critical of what they saw as the semi-closed nature of Russian higher education. The government officials made the same point about closure. 'The system is still fairly inward looking and Rus-

sian focused', said one. However, they had no constructive suggestions on how to open up the sector. It is interesting that both government people and university people saw the other group as primarily to blame for the limited character of internationalization in higher education.

3.6. The state as public good

There was less explicit discussion of public goods or the public good in terms of the political definition of 'public', 'public' as relating to the state sector. However, the role of government was an undercurrent in most of the interviews. Here what was interesting was that in the pool of interviewees there were two different and contradictory understandings of government, in general and in higher education. Interviewees usually fell into one camp or the other, though a small number seemed to draw on views from both sides of the debate. It was apparent that the two views derived from differing political philosophies, the division was fundamental to the Russian polity, and both views had entered the structuring of higher education.

In the first perspective, which was especially strong at MISIS but also evident at HSE, people discussed the role of government in terms resembling the Soviet experience. In Soviet times, the government planned the economy and education in the short-term and long-term, worked out how many specialists would be required in each category, allocated student places accordingly, funded and controlled higher education closely, and later allocated graduates to jobs. Various interviewees called up the different parts of this picture, though none presented it holistically as a desired norm or a description of present reality. For example, a number of people argued that the government should provide stable conditions of work for faculty and researchers, and several recalled with nostalgia the modest but adequate salaries of scientists, and the public respect that they had enjoyed in the Soviet time. Although government no longer directly allocates graduates to jobs, some interviewees called on the government to take action that would bring universities together with employers so that such an allocation would take place. One official did not argue for a return to labour allocation but saw the role of government as one of planning the response of higher education to the market:

'Universities in Russia... It's a production plant of employees for the government and for society. Yes. It's a training system to produce specialists. Lawyers, mechanics, engineers, so they are ready for work' (HSE administrator).

'We define the needs of economy and society, for graduates, predicting what the market will need. And then we provide the necessary funding, with implementation of this order. This is my understanding of what government should do' (government official).

Along this line of thinking, higher education was seen fundamentally as an administered enterprise rather than a student market of competing institutions in the American sense. Higher education was 'public' in both senses, it was in Quadrant 2 of Figure 1, economically public because it was politically public and therefore should be free of tuition fees:

'Both government officials and public opinion still regard the state as the main patron for higher education... 80 per cent of the university expenditures are covered by the state, so the universities mainly depend on the state... Many people here consider education as a public benefit, and it's like it should be provided for free' (HSE economist).

However, as certain interviewees pointed out, including one of those from the government, the problem with this model was that in contrast to Soviet times, the Russian government no longer used a long-term planning approach. While government officials saw themselves as powerful, responsible, funding and controlling, they are also short-term and reactive in their political thinking, and on the whole were more than happy to devolve responsibilities for graduate labour market outcomes downwards to the higher education institutions.

The second perspective was explicitly post-Soviet. These interviewees wanted to reduce both expectations about government and its real role and power in society. They tended to favour deregulation in higher education and other sectors—some argued for this even if it meant less money. While for most interviewees the government had a central and unique role, a couple of the post-Soviet interviewees saw it as just another stakeholder in higher education. There was criticism of government financial controls, rejection of official selection of rectors, and concerns about potential interventions in curriculum and teaching.

'In the 1990s the state collapsed and had no capacity to intervene and at the same time had no capacity to fund the new important things. Now there is the opposite movement of the pendulum... If I want I can get a lot of money from the government. But my attitude is to be as far away as possible' (HSE sociologist).

'The government has an extremely heavy hand. This heavy hand is only good for turning the biggest bolts and nuts' (HSE executive).

These interviewees tended to talk in terms of market models. They favoured an economic rather than political definition of public good, arguing that higher education was largely a private good, and the government should fund higher education only in those areas clearly subject to market failure. 'Most of the benefits (of higher educa-

tion) are not collective for sure, they are personal, individual' said one government official. Some preferred to talk about public 'externalities', 'spillovers' flowing from market transactions, rather than larger or more holistic public goods. Nevertheless, the post-Soviet interviewees also acknowledged that the private business sector was unwilling to finance higher education at scale. 'Actually we have no serious funding from business. In Russia we simply have the tradition of the charity', said an HSE executive. Nor could the household pay full-cost market-based tuition fees. It was accepted that this would reduce participation among students from poor families. Advocates of the post-Soviet approach varied in their beliefs about the extent to which market relations should be extended across higher education, including the present free places, but none argued for a complete withdrawal of government from policy and funding.

3.7. Divided polity, divided higher education

The division among interviewees was emblematic of a larger fracture in Russian political culture. There can be no agreement on the political conception of public/private until this fracture is resolved. There cannot even be agreement on the economics of public/private in higher education, because as noted, a person's approach to the economic question is affected by her/his political conception of the roles, limits and responsibilities of government.

As this researcher sees it, the interviewees were divided, as Russia seems to be divided, between a 1980s Soviet view of the world and the post-Soviet view of the world which emerged rapidly in the 1990s and was (and still is) sympathetic to many of the precepts of Anglo-American neoliberalism. While 1990s financial capitalism had an undeniable impact in Russia, with the privatization of many state assets, the evolution of new markets and a boom in business, economics and law programs in higher education, it did not holistically transform the political culture or constitute a stable and attractive society. The result is that in Russian society and policy, each strand, the old and the newer, tends to block the other.

'In Russia we have a split history. Some believe in one version of history, the others believe in quite the opposite version of history' (HSE historian).

The higher education system reflects this continuing division. It has become a remarkable combination of the two heterogeneous approaches. The system is about equally split between free places and fee-paying places. This cannot enable coherent policy and provision:

'I don't like the Russian way when the best students get free education and others pay, and we have in one room students that pay

and not pay, and they have different attitudes towards the university' (HSE Executive)

On the one hand, there are publicly supported places for the academically stronger students. A relatively high proportion of these students enter STEM programs, though labour market demand for their qualifications is unclear. It is almost as if they are still servicing the old military-industrial economy. On the other hand, there are the fee-based places occupied by less high scoring students, mostly preparing graduates in business, law, communications and related fields for the new capitalist economy. These places, which have become crucial in place of inadequate government funding, encourage HEIs to behave in an entrepreneurial manner. Hence in one strand of the system the old comprehensive role of government continues, in the other strand the market is supreme. The first strand is associated with the idea of higher education teaching/learning programs as a public good in both the economic and the political sense. In the second strand teaching/learning becomes a private good in both economic and political terms, though one with some public externalities.

There is a similar standoff in internationalization. Post-Soviet neoliberalism of the 1990s failed to create an open borders approach in Russia in non-financial areas like science and higher education, despite the profound globalization of these domains in most nations, and the recognition by many in Russian universities that knowledge is a global public good. The blockage at the border, plus the schizophrenic political economy of higher education, which (as in the country as a whole) tends to negate itself, mean that the sector cannot readily move forward. Across the world successful higher education systems exhibit a broad variety of political economies, from the universal free high quality Nordic public systems to the largely public approach typical of Switzerland and the Netherlands, the differing mixed economies in Canada and East Asia, and in the United States the stratified market combined with generous federal research funding that leads the higher education world. But all these systems exhibit coherent (if diverse) provision, funding and incentives. And all are internationalized.

Until the respective political cultures of the 1980s and 1990s are absorbed into a new and internally consistent system that transcends the present contrary practices, there can be no clear and stable consensus on the meanings of public/private, the public good role of higher education in Russia, and even the kinds of private goods that are produced. At the same time, the discussion of public and private goods is one way to think about system reform

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Higher Education Funding Models and Institutional Effectiveness: Empirical Research of European Experience and Russian Trends

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Abstract. World Bank data shows that education accounts for, on average, 13% of government expenditure in the world, effective spending being a priority. Position in international academic rankings has been a universally accepted, yet criticized, criterion of institutional effectiveness. No consistent positive correlation was revealed during research on how the size of government subsidies affected university ranking. Assessment methodology is adjusted to study the influence of public funding mechanisms on

university ranking. Three mechanisms are investigated: formula-based funding, outcome-based funding, and negotiated funding. The sample includes 107 European universities from 27 countries. For each of them, information on the funding model (or a combination of models), total annual revenue, proportion of public subsidies, ranking and ranking movements over the last decade is collected. Analysis results are used to group universities into two major categories: low-ranking universities (ranked in the top 200–500), which are mostly funded using formal mechanisms (formula- and outcomes-based funding), and high-rankings universities (the top 100), which largely use the negotiated funding model (either alone or combined with formal models). This confirms previous research findings that the size of government subsidies has no impact on university ranking. A qualitative analysis of higher education funding patterns in Russia is performed. Formalization of all sources of university funding has become a major trend, yet this empirical study demonstrates that prioritization of formal criteria may be ineffective if Russian universities want to reach their ambitious goals of making it to the top 100 in international rankings.

Keywords: institutional effectiveness, university funding models, formula-based funding, outcomes-based funding, negotiated funding, cluster analysis.

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Education, with its ever-growing importance, is undeniably a key resource of economic and social development in today's world. The reason behind this is that education systems, primarily those of universities, make up a part of national innovation systems. Efficient investments in education give rise to new innovative companies that establish the foundations of innovative national economies [Hazelkorn 2015; Salmi, Froumin 2007]. This is why a number of countries have intensified their efforts in designing programs and roadmaps for university development [Satsik 2014].

Russia's higher education system has also been undergoing a modernization recently [Salmi, Froumin 2013]. Presidential Decree No. 599 'On Measures for the Implementation of the National Policy in Education and Science' of May 7, 2012, which set the goal to dramatically enhance the competitive power of leading Russian universities, can be regarded as the pivotal document regulating the vector of reform policies. As soon as the position in world university rankings had been accepted as one of the key criteria of competitive strength, an objective in line with said goal was defined: to propel at least five Russian universities into the top 100 of the major world rankings by 2020. The government is ready to invest sizeable amounts in the development of national education and science, yet spending efficiency remains a great concern, as the fundamental university governance policies have not changed for over 20 years so far.

The existing university rankings are numerous, diverse and based on various methodologies, yet none of them have been immune to criticism by the academic community. The major points of criticism include the structure and weight of ranking criteria as well as the dependence of final values on the size of institution, specific education majors and areas of research [Bongioanni et al. 2014]. Even though individual indicators of university performance cannot be compared directly based on rankings, the latter have become an unavoidable reality of higher education, playing an ever more prominent role for development strategies and funding-related decisions [Amsler, Bolsmann 2012; Goglio 2016]. The Shanghai Academic Ranking of World Universities (ARWU) along with the British Times Higher Education (THE) and Quacquarelli Symonds (QS) World University Rankings, known jointly as THE-QS in 2004–2009, are the most powerful and influential international rankings today. They are used in this article to assess how performance and competitive power of universities change in the present-day market of educational services and academic research.

Formal methodologies of the world university rankings use two major groups of indicators: those related to previous academic merits and those related to current performance. These indicators are expected to illustrate the quality of university governance as a whole, its research and teaching activities, governance mechanisms and structural organization, as well as reflect the institutional aspects of univer-

sity performance, the scope of funding, and the degree of internationalization in research and teaching [Hazelkorn 2015; Aguillo et al. 2010]. All these factors are important for university performance to a varying degree, and management's crucial goal consists in setting priorities, i. e. choosing areas to focus on in order to make the university as effective as possible.

Identifying the critical aspects of university performance is a challenge that has been addressed in many publications [Salmi 2009; Yang, Welch 2012]. Major difficulties that researchers stumble upon include the lack of publicly available information on university activities and the problems arising from comparing available data in an attempt to determine statistically significant correlations (e. g. between the governance system and university ranking). Singularity of each individual university is another factor that hinders drawing conclusions and making inferences [Saisana, d'Hombres, Saltelli 2011].

Differences in funding models are the most relevant factor of diversity when it comes to Russian universities. Back in the Soviet era of a planned and closed national economy, institutions of higher education were primarily financed by the state. The activities of some of them were regulated solely by the Ministry of Education, while others were supervised by both the Ministry of Education and the industry-specific ministry. It was not on a competitive basis but according to a plan that funds were allocated among institutions (or projects within an institution), so spending efficiency was often disregarded when making managerial decisions at various levels [Platonova 2015].

Bearing in mind that a dedicated study [Auranen, Nieminen 2010] found no direct relationship between the size of university funding and its position in a specific ranking, it seems appropriate to focus on ontological analysis of the existing mechanisms and sources of funding. A modern university is able to attract private-sector investments along with governmental subsidies for its development. However, the proportion of public funding is either about the same size as that of independently raised funds or much larger than that (over 90% in some universities). It is important for the state to understand the volume, methods and conditions of funding to make a particular university as effective as possible [Bolli, Somogyi 2011]. Therefore, this study revolves around the mechanisms of public funding for universities.

In particular, the study seeks to test empirically the correlation between the mechanisms of public funding and university performance expressed as a position in world university rankings.

The article is structured as follows: Chapter 1 describes the sources and models of university funding; Chapter 2 investigates the relationship between university ranking and funding models; Chapter 3 provides an analysis of university funding in Russia; and, finally, Chapter 4 gives a summary of all the findings to draw some conclusions.

1. Models and sources of university funding

These days, university funding models are not just sets of tools to allocate funds among donors and beneficiaries (who may include the government, students or research and teaching staff). They also represent sets of mechanisms to achieve specific goals and maximize outcomes with the existing resource limitations. Where public universities dominate the education and research market (which is true for the majority of countries including Russia), a funding model is the key element of the overall university governance strategy, which traditionally consists of the following:

1. Legal regulation
2. Funding model
3. Public production
4. Communication strategy [Jongbloed 2004]

Some major trends can be identified within the higher education funding reforms that are being implemented today in Europe, Asia and America [Auranen, Nieminen 2010; Nagy, Kováts, Németh 2014]:

- Transforming the ways public funds are allocated in the education system. In order to increase the sensitivity of educational institutions to consumer needs, part of the funds is allocated directly to students and companies as government-subsidized loans or tax incentives. In addition, changes are made to the direct institutional support mechanisms (discrimination is made between funding of teaching and research; formula-based funding is getting more widespread; spending efficiency becomes an increasingly important factor of fund allocation).
- Actively introducing new open e-learning technologies efficient in reducing teaching-related expenses. This strategy can bring about an essentially new university model in the long term.
- Diversifying the sources of funding and establishing a partnership with the business community, research centers and NGOs. A direct correlation is thus formed between university performance and the amount of private funds attracted. Co-funding gives more financial management autonomy to institutions and improves the quality of public fund spending due to double auditing procedures. Once granted autonomy, universities can attract external funds from business communities in financial markets, render supplementary and business education services, and customize contracts for individual teachers and researchers.

Hence, educational activities are financed today from the following sources:

1. Government subsidies (allocated by federal and municipal governments);

Figure 1. **The structure of university funding in Europe**

2. Tuition and proceeds from education-related services (sale of study guides, accommodation services, etc.);
3. Funds received from businesses: payments for advanced training programs and individual trainings for current and prospective employees; scholarships for students that may imply a student's obligation to work for the company for some time after graduation; etc.;
4. Donations, sponsor support, endowed professorship, and other types of nonrefundable investment in education by companies and individuals;
5. System of vouchers and other governmental mechanisms of student finance (examples in Russia include maternity allowance and tax credits);
6. Other external sources of finance, such as grants from nonprofit organizations or loans;
7. Self-funding (revenues from non-core activities, such as publishing, telecommunication services, etc.);
8. Student loans.

Public grants constitute the major part of university funding in most European countries (Fig.1).

All sources of university funding except government subsidies have their own institutional mechanisms to control the efficiency of fund allocation, which often do not need to be formalized. It is public funding mechanisms whose efficiency has yet to be assessed.

Studies conducted by Thomas Estermann and Terhi Nokkala [Estermann, Nokkala 2009; Estermann, Nokkala, Steinel 2011] as well as the DEFINE Project [Estermann, Pruvot, Claeys-Kulik 2015] identify the following mechanisms of public fund allocation:

9. Public grants:
 - performance-based funding;
 - formula-based funding (input- and output-based models);
 - Negotiation (amount determined on a historical basis).
10. Project-based funding
11. Funding for excellence
12. Other types of direct and targeted funding

This study investigates the mechanisms of public funding.

Funding formula is understood as an algorithm to calculate the size of university funding using a mathematical formula. Formula variables include student population, publication performance, and other indicators. Variables are based on retrospective data (e. g. for the last year). The mechanism seeks to ensure transparency in funding justification and to bind the size of funding with measurable indicators. This funding model allows for taking into account temporal changes, such as those in the size of faculty or in the student or graduate population.

Performance contracts between a university and a public authority specify target performance indicators that the university undertakes to achieve by receiving the required amount of funding. This funding mechanism allows for structuring the dialogue between universities and public authorities, thus increasing funding transparency, as well as helping to design the strategy for university development. Unlike funding formula, the performance-based model uses prospective indicators, thus guiding universities into predetermined lines of development.

Goals to be achieved by universities under performance contracts may either be specific to the institution and consistent with its strategy to a greater or lesser extent, or result from more generalized goals of higher education and national research policies. Target indicators can be described as outcomes that should be achieved while leaving the university free to choose any specific measures to be taken within the agreed period of time. Goals may be either qualitative (e. g. promote equal access of men and women to leading academic positions) or quantitative (e. g. increase the proportion of female professors), very much like indicators in formula-based funding. Performance assessment procedures differ depending on the type of goals and objectives

and may imply either discussion between the government and university or, at other times, the collection of relevant statistics.

Negotiated funding suggests that the amount of funding has been determined historically and embraces all kinds of informal negotiation mechanisms that are used to obtain funding. On the one hand, this funding mechanism is the most obscure of all; on the other hand, allowance can be made for nearly all university characteristics, in particular university reputation, which is hard to quantify and thus cannot be included in the other two models.

The mechanisms described above can be applied to funding of both teaching and research activities. The funding models may be used separately or in combination, where one is primary and the other is secondary.

Further on, this study will dwell on the funding models and types of their combinations used in European universities, as well as on the relationship between using those mechanisms and university ranking.

2. Relationship between funding model and university position in world rankings

2.1. Research data

The following data was used to test empirically the hypothesis on the relationship between models and sources of university funding, on the one hand, and university ranking, on the other:

1. Results of the DEFINE (Designing Strategies for Efficient Funding of Universities in Europe) Project, run by the European University Association. The survey involved European countries and produced an extensive overview of funding models used in universities of each participant country as well as recommendations for university management.
2. Academic Ranking of World Universities (ARWU) 2003–2014. Unlike the other two rankings (THE and QS), this one uses objective indicators calculated based on data from official sources. As this study aims to assess the impact of specific funding mechanisms on university ranking, dynamic data on university ranking was used instead of last year's static indicators. The study is premised on the assumption that higher education funding mechanisms underwent no significant change between 2003 and 2014. Feasibility of this assumption is confirmed by the fact that results of the DEFINE Project, launched in 2007, were not published until 2015.
3. Statistics on university activities: total funding, proportion of public grants (separately for teaching and research, where applicable), student population, faculty size, etc.

The sample is restricted to universities of the European Union and Russia. More reliable findings will require including countries of North and South America, Australia, Middle and Far East, too. However, a larger-scale research is currently impossible due to the absence of systematized information on the models and mechanisms of higher education funding used in those countries.

2.2. Research design The study is built around analyzing how funding model and other university operation parameters correlate with university ranking. Research is based on the DEFINE Project, which analyzes the existing mechanisms of university funding in Europe as well as possible ways of increasing their efficiency [Pruvot, Claeys-Kulik, Estermann 2015]. The project was prompted by the crisis of 2008–2009. Back then, public grants—the main source of higher education funding—reduced in many European countries, putting steady university development under threat and introducing the need to seek out new sources of revenue and increase spending efficiency. Therefore, enhancing the finance policies in higher education became the paramount goal of the DEFINE Project.

The DEFINE Project involved 28 European countries and individual regions (*Appendix 1*). This study only uses DEFINE data on the countries that were ranked in the ARWU Ranking between 2003 and 2014, meaning that at least one university in the country was part of the ranking throughout the specified period or became as such within that period and was still in the ranking in 2014. As a result, the initial sample included 205 universities (*see Appendix 2 for the complete list*) from Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Serbia, Slovenia, Spain, Sweden, Switzerland, and Great Britain.

Because the DEFINE survey did not include all the EU countries and some of the countries were represented by their autonomous regions (Spain by Catalonia, Germany by North Rhine-Westphalia, Hesse and Brandenburg, and Great Britain by England only), some ARWU-ranked European universities were also excluded from the analysis. The final sample consisted of 157 European universities and two Russian ones (not included in the first study phase).

The following information was collected for each of the 157 European universities in the sample:

- Total funding
- Proportion of public grants
- Size of grants for teaching and research
- Amount of third-party research funding
- Tuition
- Student population
- Faculty size and proportion of research staff
- Availability of excellence centers and excellence initiatives

Information was obtained from materials posted on universities' official websites over the last year (mostly 2013/14, but some universities only provided data on the academic year 2011/12). In cases where some of the required data (e. g. financial records) was unavailable, the relevant university was excluded from the analysis. The sample shrank to 107 universities after the data collection phase.

The data obtained was unified to ensure comparability: financial indicators were converted from national currencies (for Czech Republic, Denmark, Sweden, Norway, Switzerland and England) into euros based on the European Central Bank's reference rates¹ over the relevant financial year. The resulting data was used to calculate some basic university funding indicators: total funding; total funding per student; total funding per faculty member; proportion of public grants in total funding; proportion of research grants in total public funding; proportion of teaching grants in total public funding; proportion of third-party research grants in total funding; and proportion of tuition revenues in total funding.

The DEFINE Project associated each university with a specific national (or regional) model of teaching and research funding, which was described by six variables: funding formula for teaching; performance contracts for teaching; negotiations for teaching; funding formula for research; performance contracts for research; and negotiations for research.

Each university was assigned an index according to its ARWU ranking: "1" for the top 100, "2" for positions 101–200, "3" for positions 201–300, etc. Additional variable showed university ranking movements between 2003 and 2015: "1" for moving up, "0" for retaining the position, and "–1" for moving down the ranking.

As a result, three sets of data were provided for each university:

1. University funding models are contingent on the country and described by the following variables:
 - a. Funding formula for teaching (FFT)
 - b. Performance contracts for teaching (PCT)
 - c. Negotiations for teaching (NT)
 - d. Funding formula for research (FFR)
 - e. Performance contracts for research (PCR)
 - f. Negotiations for research (NR)
2. The size of university funding is described by the following variables:
 - a. Total funding per student (mln euros)
 - b. Total funding per faculty member (mln euros)
 - c. Total funding (mln euros)
 - d. Proportion of public grants in total funding
 - e. Proportion of research grants in total public funding
 - f. Proportion of teaching grants in total public funding
 - g. Proportion of third-party research grants in total funding
 - h. Proportion of tuition revenues in total funding
3. University ranking is described by the following variables:

¹ <https://www.ecb.europa.eu/stats/exchange/eurofxref/html/index.en.html>

Table 1. **Description of the specifications tested during cluster analysis**

Specification #	Variables involved	Observations used
1	Proportion of public grants (Gov_share), university funding model (FFT, PCT, NT, FFR, PCR, NR), and university ranking (Rat_fin_year)	All / w/o Great Britain
2	University funding model (FFT, PCT, NT, FFR, PCR, NR) and university ranking (Rat_fin_year)	
3	Proportion of public grants (Gov_share), research funding model (FFR, PCR, NR), and university ranking (Rat_fin_year)	
4	Teaching funding model (FFR, PCR, NR) and university ranking (Rat_fin_year)	

- a. University ranking during the financial year
- b. University ranking movements

The universities were divided into groups based on the funding models they used and the proportion of public grants in order to test the relationship between the size and mechanism of public funding and university ranking. Various modifications of cluster analysis procedures were used. Data was analyzed using the IBM SPSS Statistics 20.0 tool. The base specification included variables describing funding models for both teaching and research as well as university ranking. Additional variables described the size of university funding. The variables describing university funding models were reduced to research funding models: the ARWU Ranking does not assess teaching quality, so teaching funding models may be irrelevant to university ranking.

Examples of the abovementioned specifications are given in Table 1, where the size of university funding is represented by the proportion of public grants. Specifications with other funding variables were also tested.

2.3. Empirical findings

In general, correlations between funding model and university ranking were revealed as various specifications were tested. Specifications that assessed the size of university funding in one form or another were inferior to those that only analyzed university ranking positions and funding models. The analysis produced three clusters, which are described in Tables 2 and 3.

The first cluster mostly consists of the top 100 universities. It also includes some universities with other indexes, but their proportions are considerably lower. Institutions in this category normally use negotiations for research as their primary funding mechanism, whereas funding formula for research is mostly used as the secondary model and performance contracts are not used at all. Teaching in this cat-

Table 2. **Clustering criteria**

Variable		Cluster 1	Cluster 2	Cluster 3
Observations in the cluster		43	36	28
Teaching funding	Funding formula	1 (2)	1	1
	Performance contracts	0	2	2
	Negotiations	0 (1)	0 (1;2)	0
Research funding	Funding formula	2(1)	1	1
	Performance contracts	0	2	2
	Negotiations	1 (0)	2 (0)	0
University ranking	Top 100	47%	11%	0%
	101–200	19%	64%	0%
	201–300	21%	17%	29%
	301–400	14%	8%	21%
	401–500	0%	0%	50%

Note: 1 indicates that the funding mechanism is used as primary; 2 indicates that the funding mechanism is used as secondary; 0 indicates that the funding mechanism is not used. Digits in round brackets indicate that some universities within the cluster (a minor part) use the funding mechanism differently.

Table 3. **Descriptive characteristics of the clusters**

Indicator	Value	Cluster 1	Cluster 2	Cluster 3
Centers of excellence (%)	No	44	56	39
	Yes	56	44	61
Ranking movements (%)	Down	7	11	29
	None	74	53	50
	Up	19	36	21
Amount of funding (mln euros)	Total funding per student	0.03	0.02	0.018
	Total funding per faculty member	0.18	0.21	0.20
	Total funding	704.7	540.7	317.6
	Public funding per student	0.02	0.01	0.009
Proportions of selected sources in total funding (%)	Public grants in total funding	60	49	49
	Public grants for research in total public funding	55	48	50
	Public grants for teaching in total public funding	45	52	50
	Third-party research grants in total funding	33	24	20
	Tuition revenues in total funding	24	28	36

egory is mainly subject to formula-based funding and partly funded through negotiations. The second cluster mostly includes universities ranked 101–200, which largely use formalized funding mechanisms, namely funding formula as the primary mechanism and performance contracts as the secondary one. They either use negotiations as their secondary mechanism or do not use them at all. The third cluster consists of universities ranked 201–500. These never use negotiations and rely heavily on formal funding models. The specified differences between the clusters are statistically significant, the results being tested using Pearson's chi-squared test. The test results, the breakdown of observations by clusters and their description are given in Appendices 4 and 5.

No firm conclusion can be drawn based on cluster analysis by such parameters as university ranking movements or availability of centers of excellence as to whether these indicators correlate somehow with funding mechanisms. Although the clusters differ statistically significantly in the size of funding, no relationship is revealed between the amount of public grants and university ranking. The mechanisms of public funding proper are thus what appears to be a more important factor.

These results allow for a conclusion that universities using negotiations in addition to formal funding procedures are ranked higher by ARWU.

3. Characteristics of university funding in Russia

Global trends of information integration that have intensified greatly over the last decade following the telecommunications boom require Russian authorities to focus on improving the international competitiveness of Russian education. Enhancement of education finance systems is the key prerequisite for such improvement. Educational institutions are largely heterogeneous both in their administrative organization and availability of materials and resources, so promoting internal competition in conditions of publicity, transparency and objectivity was expected to produce maximum positive effects.

A competitive academic environment in Russia is created by introducing normative per capita funding, which suggests that universities are granted public funds proportionally to the population of government-funded students. The latter is estimated using admission quotas in compliance with stipulated standard costs of education. Admission quotas are distributed on a competitive basis in accordance with the Ministry of Education and Science, which implies comparing requests from educational institutions. Such requests contain indicators of university potential in specific domains or majors (or categories of domains or majors) that are assessed during selection. The overall amount of admission quotas is agreed upon in advance by supervising authorities (ministries and associations), which design policies for every domain or major and suggest solutions on the structure

of admission quotas for every subject of the Russian Federation. The standard cost of an educational service is estimated by applying region- and industry-specific correction coefficients of individual institutions to the unified base standard cost of this service. The approved list of coefficients and their values predetermines quite a vast range of normative price deviations for the same educational service between universities. Greater relative public support is enjoyed by universities that perform better in the indicators assessed: the average USE (Unified State Examination) score of students admitted to the major or department; the amount of revenues from research and development per faculty member; the number of publications in journals indexed in Web of Science and Scopus per 100 faculty members; etc.

As a result of the budget reform (transition to program-based budgeting), public funding of Russian universities is essentially based on indirect formalization of the results of bidding procedures under the national 'Education Development for 2013–2020' program in the form of individual subprograms and initiatives segmented by different types of activities. Bidding results are recorded in quarterly budget breakdowns. Apart from targeting expenditures, assigning fixed responsibilities and verifying congruence of goals, objectives and indicators, the structure of such breakdowns, together with the Ministry of Education and Science's recommended practices for determining standard costs associated with education program implementation, is designed both to extend the analytical potential of supervising ministries and to ensure system responsiveness to changes in the strategic vector of national policies (by adjusting priority schemes, public funding mechanisms, etc.).

An increase in the analytical potential naturally leads to comparing individual indicators of university performance with a view to identifying institutions below threshold values and applying organizational and administrative measures to them. This phase of the education reform is formalized in the national monitoring of public educational institutions, the results of which serve as the basis for possible reorganization. Despite criticism from NGOs and the expert community—mostly regarding the lack of unbiased decisions—systematic monitoring has amplified the control of university management over certain university sectors and inspired many of the innovative solutions.

Unfortunately, the improvements in governance efficiency achieved at the level of individual universities have not been fully extended to the national Education Development 2013–2020 program as a whole. System responsiveness is obstructed by bureaucratic processes, mostly delays in the approval of amendments to national programs (including the initiative funding chapter) by the Ministry of Economic Development and the Ministry of Finance and in the publication of relevant governmental acts and regulations. As a result, the implementation lag takes about a year, which is unacceptable in the unstable macroeconomic conditions.

Figure 2. **Changes in the rough structure of university funding between 2012 and 2015.**



The dramatic decrease in public funding became the main macroeconomic factor to directly affect the financial standing of universities. Spending in such vital areas as overhaul, student allowances and investments has been cut following the two rounds of 10% sequestration carried out by the Russian government over the last two years. Furthermore, funding for education programs was reduced too, as public grants for universities were revised using the standard cost methodology.

Cuts in public funding are accompanied by a decreasing effective demand from Russian consumers for educational services, caused by the drop in their purchasing power as well as by the “demographic trough” of the 1990s and its anticipated effects. The reduction in funding for university research—this expenditure item was forced out by the costs of daily needs—does not allow for covering the cash deficit at the expense of income-generating activities. This is proved by universities’ financial results (Fig. 2) indicated in their business plans. In this situation, Russian universities have to raise prices for their educational services, switching from competitive pricing (maximizing enrolment rates) to the prohibitive policy (maximizing costs). Given the global reach of the impact factors, such response is virtually ubiquitous, putting prospective students in a situation identical to price fixing.

These circumstances generate a sharp rise in the competition between universities for students from far-abroad countries, whose purchasing power has skyrocketed with the slump of ruble.

In order to keep to the schedule of getting Russian universities into the top 100 of the world rankings—stipulated by Section V of the Action Plan “Changes in Social Industries Designed to Increase Efficiency in Education and Science”²—the Ministry of Education and Science included resource concentration into the concept of normative per capita funding, meaning that relative volumes of funding are increased for universities that are likely to get into or move up the world rankings. With this in mind, activity characteristics of such universities were made a priority when devising multiplying factors to apply to the base funding rates.

² Approved by the Resolution of the Government of the Russian Federation No. 2620-p of December 30, 2012.

As a result of these reforms, public grants allocated under government contracts with the universities included in major rankings increased by more than 20% from 2013³ to 2016. Besides, the most promising universities are offered additional government funding under Project 5–100 implemented in compliance with the Order of the Government of the Russian Federation No. 2006-p of October 29, 2012. These are targeted subsidies granted to winners of the university development program tender carried out under the auspices of the Council on Competitiveness Enhancement of Leading Russian Universities among Global Research and Education Centers. The size of subsidies is revised annually depending on the outcomes achieved.

Resource concentration was expected to promote qualitative transformation of the existing performance standards followed by selected universities into a local equivalent of the most advanced foreign models, which would boost their rise up the rankings. Unfortunately, not all the financial incentives had a positive effect. The movements of Russian universities in the QS Rankings (see Appendix 3)⁴ in 2013–2016 (seven rose, six fell, and eight retained their positions) do not go beyond statistical deviations. There is almost no correlation between intensified funding in the form of targeted government subsidies and university ranking. For instance, Kazan (Volga Region) Federal University rose from the 601–650 category up to 551–600 despite the 358 mln ruble cut in subsidies, whereas Ural Federal University, named after the first President of Russia B. N. Yeltsin, slipped down from 501–550 to 601–650 even though it had been granted an additional 227 mln rubles. Thus, a considerable increase in funding did not entail better ranking positions for a number of universities, including the National Research University Higher School of Economics (HSE) and Southern Federal University.

Between 2013 and 2015, only 13 Russian universities improved their positions in the QSBRICS Ranking (see Appendix 4), where Russian universities are represented better than in the QS Rankings (58 positions as compared to 21), while 25 institutions moved down and 20 remained where they were. Such a degradation of the situation, not least induced by exogenous political and economic factors, discredits somewhat the concept of normative funding for universities, given that no other significant institutional transformations affected the education system during that period. Apparently, the normative approach to higher education funding is not the best option at the time of global social transformations.

The effects of additional competitive grants look more reassuring. According to the most recent report of the Ministry of Education and

³ The year of completing the transition to normative per capita funding of universities beyond governmental jurisdiction.

⁴ <http://studyinrussia.ru/why-russia/world-university-rankings/qs/>

Science⁵, the number of Russian universities in the QS World University Rankings increased over the last few years (up to 24 in 2017) due to the increase in the number of Project 5–100 participants that received competitive targeted grants (from 9 in 2012 to 15 in 2017). Putting aside qualitative analysis of the changes in technical indicators (faculty-student ratio first of all) responsible for this growth, it can be safely stated that direct competitive funding algorithms based on the performance of specific goals look more preferable than normative funding models.

There is certain conceptual congruence between the key university funding models in Russia and abroad. For example, subsidies under government contracts bear the hallmarks of formula-based funding, while targeted grants for the implementation of development programs (implying achievement of predetermined indicator values) can be interpreted as an equivalent of performance contracts. Meanwhile, the proportion of negotiations when allocating targeted grants is higher in Russia due to the absence of intermediate decision-making elements that distort original arrangements as they are put into practice.

Given the high volatility in all spheres of state life (including business and law), negotiated funding appears to be the most viable model. This algorithm suggests that the size of university funding for a planning period is determined based on thorough and comprehensive assessment of all aspects of university life and subsequent comparison to the respective indicators of other applicants, using budget data of the previous period as a reference. The rigid formula-based system that underlies the existing concept of normative per capita funding will only be able to provide a similar level of flexibility and responsiveness if there is a powerful statistical framework and an elaborated methodology of determining the key indicative criteria, which amount to dozens. Unfortunately, procedures necessary to gather and process the required amount of data are only being introduced in Russia. An important step in this direction was made as the Ministry of Education and Science systematized universities' analytical reporting processes and designed new single-entry templates.

4. Conclusion and avenues for further research

States are ready to invest sizeable amounts into universities. However, it is important to monitor efficiency of university activities in general and spending in particular. University ranking has been universally accepted as a metric of university performance. Meanwhile, empirical research reveals no consistent positive correlation between the size of funding and university ranking. This study attempts to probe the relationship between university ranking movements and the funding mechanism, not the amount of funding. Cluster analysis reveals that

⁵ <http://5top100.ru/news/58610/>

universities funded through negotiations, in addition to formal models (funding formula and performance contracts), show better performance in the rankings. Nonetheless, no correlation is found between the size of public grants and university ranking; the mechanism of public funding appears to be a more important factor.

Characteristics of public funding for Russian universities have been analyzed in the context of global experience findings using the example of institutions that see improving their world ranking positions as a strategic priority. Combinations of formula- and performance-based mechanisms have been found to prevail in public funding of universities, which echoes the policies pursued by universities from the second cluster in the international part of the study.

In the light of the data obtained on the sample of European universities—indicating that universities using negotiated funding mechanisms along with formal models are ranked higher (first cluster)—hopeful prospects for Russian institutions are offered by the promotion of new formats and types of funding that imply extended use of negotiations. Advisability of negotiated funding is confirmed by the specific conditions in which Russian universities exist, having to achieve extremely ambitious goals while facing severe resource limitations. Under these circumstances, it would be unwise to rely on clichéd patterns to establish a well-functioning, long-lasting system of cross-institution interaction.

In summary, the overarching goal faced by Russian higher education today consists in creating an innovative conception of public funding for leading universities that will be premised on the negotiations approach and not restricted to mechanically reallocating the resource potential in favor of individual educational institutions under the presence of growth point generation. A separate study is proposed to design the methodological framework for this conception.

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Appendix 1.
The list of countries involved in cluster analysis

AT — Austria	HU — Hungary
BE-FL — Flanders in Belgium	IE — Ireland
BE-FR — French speaking community in Belgium	IS — Iceland
CH — Switzerland	IT — Italy
CZ — Czech Republic	LT — Lithuania
DE-BB — Brandenburg in Germany	LV — Latvia
DE-HE — Hesse in Germany	NL — Netherlands
DE-NRW — North Rhine—Westphalia in Germany	NO — Norway
DK — Denmark	PL — Poland
EE — Estonia	PT — Portugal
ES-CA — Catalonia in Spain	RO — Romania
FI — Finland	SE — Sweden
FR — France	SK — Slovakia
	TR — Turkey
	UK-EN — England in United Kingdom

Appendix 2.
The list of universities included in and excluded from the analysis

#	University	Country	DEFINE country code	Included in the analysis
1	University of Vienna	Austria	AT	+
2	Medical University of Vienna			+
3	University of Innsbruck			+
4	Medical University of Graz			+
5	University of Graz			+
6	Vienna University of Technology			+
7	Ghent University	Belgium	BE-FL	+
8	Catholic University of Leuven			+
9	University Libre Bruxelles		BE-FR	+
10	Catholic University of Louvain			+
11	Vrije University Brussel		BE-FL	+
12	University of Liege		BE-FR	+

#	University	Country	DEFINE country code	Included in the analysis
13	University of Antwerp	Belgium	BE-FL	+
14	Charles University in Prague	Czech	CZ	+
15	University of Copenhagen	Denmark	DK	+
16	Aarhus University			+
17	Technical University of Denmark			+
18	University of Southern Denmark			+
19	Aalborg University			+
20	University of Helsinki	Finland	FI	+
21	University of Oulu			+
22	University of Turku			+
23	Aalto University			+
24	University of Eastern Finland			+
25	University of Jyvaskyla			+
26	Pierre and Marie Curie University— Paris 6	France	FR	+
27	University of Paris Sud (Paris 11)			+
28	Ecole Normale Supérieure — Paris			+
29	University of Strasbourg			+
30	University of the Mediterranean (Aix-Marseille 2)			+
31	University of Paris Diderot (Paris 7)			+
32	Joseph Fourier University (Grenoble 1)			+
33	University of Paris Descartes (Paris 5)			+
34	Claude Bernard University Lyon 1			+
35	Ecole Normale Supérieure — Lyon			+
36	Paul Sabatier University (Toulouse 3)			+
37	University of Bordeaux 1			+
38	University of Lorraine			+
39	University of Montpellier 2			+
40	Ecole Polytechnique			+
41	ESPCI ParisTech			+
42	University of Paris Dauphine (Paris 9)			+
43	MINES ParisTech			+
44	University of Auvergne			+
45	University of Nice Sophia Antipolis	+		

#	University	Country	DEFINE country code	Included in the analysis
46	University of Rennes 1	France	FR	+
47	University of Heidelberg	Germany	DE	-
48	Technical University Munich			-
49	University of Munich			-
50	University of Bonn		DE-NRW	+
51	University of Frankfurt		DE-HE	+
52	University of Freiburg		DE	-
53	University of Göttingen		DE	-
54	University of Münster		DE-NRW	+
55	University of Hamburg		DE	-
56	University of Kiel		DE	-
57	University of Koeln		DE-NRW	+
58	University of Tübingen		DE	-
59	University of Würzburg			-
60	University of Karlsruhe			-
61	RWTH Aachen University		DE-NRW	+
62	Dresden University of Technology		DE	-
63	University of Erlangen-Nuremberg			-
64	University of Leipzig			-
65	University of Mainz			-
66	University of Marburg		DE-HE	+
67	University of Stuttgart	DE	-	
68	Hannover Medical School		-	
69	Technical University of Berlin		-	
70	University of Bochum	DE-NRW	+	
71	University of Düsseldorf	DE	-	
72	University of Duisburg-Essen	DE-NRW	+	
73	University of Giessen	DE-HE	+	
74	University of Ulm	DE	-	
75	University of Bielefeld	DE-NRW	+	
76	Technical University Darmstadt	DE-HE	+	
77	Technical University of Braunschweig	DE	-	
78	University of Bayreuth		-	
79	University of Bremen		-	

#	University	Country	DEFINE country code	Included in the analysis
80	University of Halle-Wittenberg	Germany	DE	-
81	University of Hannover			-
82	University of Jena			-
83	University of Konstanz			-
84	University of Regensburg			-
85	University of Rostock			-
86	National and Kapodistrian University of Athens	Greece	GR	+
87	Aristotle University of Thessaloniki			+
88	Eotvos Lorand University	Hungary	HU	+
89	University of Szeged			+
90	Trinity College Dublin	Ireland	IE	+
91	University College Dublin			+
92	University College Cork			+
93	University of Roma—La Sapienza	Italy	IT	+
94	University of Milan			+
95	University of Padua			+
96	University of Pisa			+
97	University of Turin			+
98	Polytechnic Institute of Milan			+
99	University of Bologna			+
100	University of Florence			+
101	Scuola Normale Superiore—Pisa			+
102	University of Naples Federico II			+
103	Catholic University of the Sacred Heart			+
104	University of Ferrara			+
105	University of Genoa			+
106	University of Milan—Bicocca			+
107	University of Palermo			+
108	University of Parma			+
109	University of Pavia			+
110	University of Perugia			+
111	University of Roma—Tor Vergata			+
112	University of Trieste			+

#	University	Country	DEFINE country code	Included in the analysis
113	Utrecht University	Netherlands	NL	+
114	University of Groningen			+
115	Leiden University			+
116	VU University Amsterdam			+
117	Radboud University Nijmegen			+
118	University of Amsterdam			+
119	University of Wageningen			+
120	Erasmus University			+
121	Delft University of Technology			+
122	University of Maastricht			+
123	Eindhoven University of Technology			+
124	University of Twente			+
125	University of Oslo			Norway
126	Norwegian University of Science and Technology	+		
127	University of Bergen	+		
128	Jagiellonian University	Poland	PL	+
129	University of Warsaw			+
130	University of Lisbon	Portugal	PT	+
131	University of Porto			+
132	University of Coimbra			+
133	Moscow State University	Russia	—	Не на всех этапах
134	Saint Petersburg State University			
135	University of Belgrade	Serbia	—	—
136	University of Ljubljana	Slovenia	—	—
137	University of Barcelona	Spain	ES-CA	+
138	Autonomous University of Barcelona			+
139	Autonomous University of Madrid		ES	—
140	Complutense University of Madrid			—
141	University of Pompeu Fabra		ES-CA	+
142	Polytechnic University of Valencia		ES	—
143	University of Granada			—
144	University of Valencia			—

#	University	Country	DEFINE country code	Included in the analysis
145	Polytechnic University of Catalonia	Spain	ES-CA	+
146	University of Santiago Compostela		ES	-
147	University of Seville		-	
148	University of the Basque Country		-	
149	University of Zaragoza		-	
150	Karolinska Institute	Sweden	SE	+
151	Uppsala University			+
152	Stockholm University			+
153	Lund University			+
154	University of Gothenburg			+
155	Royal Institute of Technology			+
156	Swedish University of Agricultural Sciences	Sweden	SE	+
157	Chalmers University of Technology			+
158	Linköping University			+
159	Umeå University			+
160	Stockholm School of Economics			+
161	Swiss Federal Institute of Technology Zurich			Switzerland
162	University of Zurich	+		
163	University of Geneva	+		
164	University of Basel	+		
165	Swiss Federal Institute of Technology of Lausanne	+		
166	University of Bern	+		
167	University of Lausanne	+		
168	Istanbul University	Turkey	TR	+
169	University of Cambridge	UK	UK-EN	+
170	University of Oxford			+
171	University College London			+
172	The Imperial College of Science, Technology and Medicine			+
173	The University of Manchester			+
174	The University of Edinburgh			UK
175	King's College London		UK-EN	+

#	University	Country	DEFINE country code	Included in the analysis
176	University of Bristol	UK		+
177	University of Warwick			+
178	London School of Economics and Political Science			+
179	The University of Glasgow		UK	-
180	The University of Sheffield		UK-EN	+
181	University of Birmingham			+
182	University of Leeds			+
183	University of Liverpool			+
184	University of Nottingham			+
185	University of Southampton			+
186	Cardiff University		UK-EN	+
187	Queen Mary, University of London			+
188	University of Exeter			+
189	University of Sussex			+
190	Newcastle University			+
191	The University of Dundee		UK	-
192	University of Aberdeen			-
193	University of East Anglia		UK-EN	+
194	University of Leicester			+
195	University of York			+
196	Lancaster University			+
197	London School of Hygiene and Tropical Medicine			+
198	Queen's University Belfast		UK	-
199	The University of Reading		UK-EN	+
200	University of St Andrews	UK	-	
201	Brunel University	UK-EN	+	
202	University of Bath		+	
203	University of Essex		+	
204	University of Surrey		+	

Appendix 3. Russian universities in the QS World University Rankings and sources of their funding

#	University	Period				Government contracts		Other sources of funding		Proportion of public grants	
		2012/2013	2013/2014	2014/2015	2015/2016	2013	2015	2013	2015	2013	2015
1	Lomonosov Moscow State University	116	120	114	108	9,633,204,100	10,767,125,300	9,377,234,910	13,412,680,983	50.7	44.5%
2	Saint Petersburg State University	253	240	233	256	6,893,830,600	5,953,167,300	5,787,655,931	4,831,998,317	54.4	44.5%
3	Bauman Moscow State Technical University	352	334	322	338	5,176,404,900	6,100,029,900	7,675,403,072	6,214,721,248	40.3	55.2%
4	Novosibirsk State University	371	352	328	317	870,851,800	1,301,321,356	3,507,962,988	3,038,763,150	19.9	49.5%
5	Moscow State Institute of International Relations (University) run by the Ministry of Foreign Affairs of Russia	367	386	399	397	708,585,400	744,633,500	1,759,363,600	2,311,949,499	28.7	30.0%
6	Moscow Institute of Physics and Technology	—	441–450	411–420	431–440	996,848,900	2,554,528,900	2,850,320,942	3,263,685,796	25.9	24.4%
7	Peoples' Friendship University of Russia	501–550	491–500	471–480	601–650	1,850,449,200	1,702,519,900	3,835,681,068	6,096,668,042	32.5	43.9%
8	National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)	—	—	481–190	501–550	2,754,966,500	3,526,147,400	5,971,333,820	4,536,167,944	31.6	21.8%
9	Peter the Great St. Petersburg Polytechnic University	—	451–460	481–490	471–480	2,632,643,100	3,303,313,700	4,818,382,300	4,484,481,691	35.3	43.7%
10	National Research Tomsk State University	551–600	551–600	491–500	481–490	1,665,981,500	2,700,990,900	2,758,751,366	2,871,126,124	37.7	42.4%
11	National Research University Higher School of Economics	501–550	501–550	501–550	501–550	5,522,833,900	6,611,898,300	10,139,126,642	11,701,853,600	35.3	48.5%
12	Tomsk Polytechnic University	601+	551–600	501–550	481–490	3,156,467,601	3,831,017,400	4,037,704,022	4,819,075,097	43.9	36.1%
13	Kazan (Volga Region) Federal University	601+	601–650	551–600	551–600	3,982,437,900	3,623,989,100	4,087,323,830	4,668,284,478	49.4	44.3%
14	Ural Federal University named after the first President of Russia B. N. Yeltsin	451–500	501–550	551–600	601–650	3,409,739,400	3,636,428,900	5,064,912,752	4,923,086,592	40.2	43.7%
15	Saratov State University	—	—	601–650	601–650	975,850,900	1,136,674,200	844,521,819	952,731,267	53.6	42.5%
16	Southern Federal University	—	601–650	601–650	601–650	2,297,270,100	2,875,601,200	3,004,536,889	2,926,342,175	43.3	54.4%
17	Far Eastern Federal University	601+	701+	701+	651–700	5,257,960,700	6,559,616,100	3,636,026,985	4,808,476,321	59.1	49.6%
18	Lobachevsky State University of Nizhni Novgorod (Lobachevsky University)	601+	701+	701+	701+	1,119,985,800	1,654,131,900	3,289,176,069	3,353,197,687	25.4	57.7%
19	National University of Science and Technology "MISiS"	—	—	701+	701+	772,380,200	3,752,798,700	3,401,992,389	3,401,271,093	18.5	33.0%
20	Plekhanov Russian University of Economics	601+	701+	701+	701+	н/д	126,161,077	н/д	326,272,099	—	52.5%
21	Voronezh State University	—	701+	701+	701+	н/д	н/д	н/д	н/д	—	27.9%

Appendix 4. Russian universities in the QS BRICS Rankings

#	University	Period			
		2012/2013	2013/2014	2014/2015	2015/2016
1	Lomonosov Moscow State University	3	3	4	7
2	Saint Petersburg State University	14	12	15	20
3	Bauman Moscow State Technical University	33	36	35	38
4	Novosibirsk State University	22	18	19	20
5	Moscow State Institute of International Relations (University) run by the Ministry of Foreign Affairs of Russia	37	35	39	44
6	Moscow Institute of Physics and Technology	55	52	45	48
7	Peoples' Friendship University of Russia	86	82	84	99
8	National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)	65	57	51	50
9	Peter the Great St. Petersburg Polytechnic University	47	47	60	61
10	National Research Tomsk State University	58	47	44	43
11	National Research University Higher School of Economics	50	58	63	62
12	National Research Tomsk Polytechnic University	71	67	64	64
13	Kazan (Volga Region) Federal University	79	69	72	74
14	Ural Federal University named after the first President of Russia B. N. Yeltsin	84	80	77	78
15	Saratov State University	—	121–130	121–130	151–200
16	Southern Federal University	89	85	81	85
17	Far Eastern Federal University	99	100	98	94
18	Lobachevsky State University of Nizhni Novgorod (Lobachevsky University)	74	72	86	76
19	National University of Science and Technology "MISIS"	—	98	89	87
20	Plekhanov Russian University of Economics	—	100	91	90
21	Voronezh State University	91	90	111–120	111–120
22	Moscow Power Engineering Institute	97	101–110	121–130	111–120
23	ITMO University	—	111–120	99	101–110
24	Perm State University	—	111–120	111–120	131–140
25	Tomsk State University of Control Systems and Radioelectronics	—	111–120	121–130	141–150
26	Gubkin Russian State University of Oil and Gas	—	121–130	121–130	151–200
27	Mendeleev University of Chemical Technology of Russia	—	121–130	121–130	141–150
28	Saint Petersburg Electrotechnical University "LETI"	—	121–130	101–110	121–130
29	Herzen State Pedagogical University of Russia	—	131–140	121–130	141–150
30	Moscow Aviation Institute (National Research University)	—	131–140	121–130	131–140
31	Moscow State Linguistic University	—	131–140	121–130	141–150

#	University	Period			
		2012/2013	2013/2014	2014/2015	2015/2016
32	Moscow State University of Civil Engineering	—	131–140	131–140	141–150
33	Saint Petersburg Mining University	—	131–140	101–110	121–130
34	Novosibirsk State Technical University	—	131–140	111–120	101–110
35	Belgorod State Technological University named after V.G.Shukhov	—	141–150	151–200	151–200
36	Irkutsk State University	—	141–150	131–140	151–200
37	Russian Presidential Academy of National Economy and Public Administration under the President of the Russian Federation (RANEPA)	—	141–150	131–140	121–130
38	Altai State University	—	151–200	141–150	131–140
39	Belgorod State University	—	151–200	151–200	151–200
40	Financial University under the Government of the Russian Federation	—	151–200	151–200	151–200
41	Kaliningrad State Technical University	—	151–200	151–200	151–200
42	Kazan National Research Technical University named after A.N.Tupolev	—	151–200	151–200	151–200
43	Kazan National Research Technological University	—	151–200	141–150	151–200
44	Ammosov North-Eastern Federal University	—	151–200	151–200	151–200
45	Northern (Arctic) Federal University named after M.V. Lomonosov	—	151–200	—	201–250
46	Petrozavodsk State University	—	151–200	151–200	151–200
47	Russian State University for the Humanities	—	151–200	151–200	151–200
48	Saint-Petersburg University of Economics	—	151–200	—	—
49	Samara State Aerospace University	—	151–200	151–200	151–200
50	Samara State University	—	151–200	151–200	—
51	Siberian Federal University	—	151–200	151–200	151–200
52	South Ural State University	—	151–200	151–200	151–200
53	Volgograd State University	—	151–200	151–200	151–200
54	Immanuel Kant Baltic Federal University	—	—	151–200	131–140
55	N. P. Ogarev's Mordovia State University	—	—	151–200	—
56	National Research University of Electronic Technology "MIET"	—	—	—	201–250
57	Moscow Technical University of Communications and Informatics	—	—	—	201–250
58	Perm National Research Polytechnic University	—	—	—	201–250

Appendix 5. Quantitative results of cluster analysis

Table A5.1. Cluster characteristics by the variables included in cluster analysis

Funding formula for teaching

	Chi-square test results
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Not used	3,373
2	4
0	0,497
2	Likelihood Ratio
Primary	4,553
27	4
26	0,336
20	Linear-by-Linear Association
Secondary	1,054
14	1
10	0,305
6	N of Valid Cases
Total observations	107
43	
36	
28	

Performance contracts for teaching

	Chi-square test results
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Not used	58,25
33	4
2	0
3	Likelihood Ratio
Primary	64,663
2	4
0	0
2	Linear-by-Linear Association
Secondary	38,068
8	1
34	0
23	N of Valid Cases
Total observations	107
43	
36	
28	

Negotiations for teaching

	Chi-square test results
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Not used	36,653
29	4
10	0
21	Likelihood Ratio
Primary	39,577
14	4
10	0
6	Linear-by-Linear Association
Secondary	0,228
0	1
16	0,633
1	N of Valid Cases
Total observations	107
43	
36	
28	

Funding formula for research

	Chi-square test results
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Not used	21,896
3	4
4	0
3	Likelihood Ratio
Primary	22,334
13	4
26	0
19	Linear-by-Linear Association
Secondary	10,725
27	1
6	0,001
6	N of Valid Cases
Total observations	107
43	
36	
28	

Performance contracts for research

Chi-square test results	
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Not used	58,25
33	4
2	0
3	Likelihood Ratio
Primary	64,663
2	4
0	0
2	Linear-by-Linear Association
Secondary	38,068
8	1
34	0
23	N of Valid Cases
Total observations	107
43	
36	
28	

Negotiations for research

Chi-square test results	
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Not used	1,862
15	2
14	0,394
21	Likelihood Ratio
Primary	1,866
28	2
6	0,393
6	Linear-by-Linear Association
Secondary	0,057
0	1
16	0,812
1	N of Valid Cases
Total observations	107
43	
36	
28	

Ranking position

Chi-square test results	
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
1-100	86,787
20	8
4	0
0	Likelihood Ratio
101-200	93,317
8	8
23	0
0	Linear-by-Linear Association
201-300	41,668
9	1
6	0
8	N of Valid Cases
301-400	107
6	
3	
6	
401-500	
0	
0	
14	
Total observations	
43	
36	
28	

Ranking movement

Chi-square test results	
Cluster	Value
1	df
2	Asymp. Sig. (2-sided)
3	Pearson Chi-Square
Down	10,797
3	4
4	0,029
8	Likelihood Ratio
No change	10,022
32	4
19	0,04
14	Linear-by-Linear Association
Up	1,07
8	1
13	0,301
6	N of Valid Cases
Total observations	107
43	
36	
28	

Table A5.2. **Descriptive cluster characteristics by the variables excluded from cluster analysis**

	Average amount of funding						Kruskal-Wallis test results		
	Cluster 1		Cluster 2		Cluster 3		χ^2	df	Asymp. Sig.
	Mean	Observations	Mean	Observations	Mean	Observations			
Amount of funding (mln euros)									
Total funding per student	0,03**	43	0,02**	36	0,018**	28	5,80	2	0,06
Total funding per faculty member	0,18	33	0,21	25	0,20	19	1,90	2	0,39
Total funding	704,7***	43	540,7***	36	317,6***	28	37,63	2	0,00
Public funding per student	0,02***	38	0,01***	27	0,009***	23	15,34	2	0,00
Proportions of selected sources in total funding (%)									
Public grants in total funding	60,0***	38	48,8***	27	48,7***	23	7,93	2	0,02
Public grants for research in total public funding	55	16	48	12	50	15	1,79	2	0,41
Public grants for teaching in total public funding	45	16	52	12	50	15	1,79	2	0,41
Third-party research grants in total funding	33	33	24	14	20	7	4,42	2	0,11
Tuition revenues in total funding	24	10	28	20	36	17	3,78	2	0,15

*** $p < 1\%$, ** $p < 5\%$.

Appendix 6

Table A6.1. **University distribution by country**
(the table indicates the number of universities from a specific country in the relevant cluster)

Country	Cluster		
	1	2	3
AT	2		2
BE-FL	4		
BE-FR	1		
CZ	1		
DK	4		1
FI	1		5
FR		6	4
DE-NRW	6		1
DE-HE		2	

Country	Cluster		
	1	2	3
IE		1	1
IT		4	1
NL		12	
NO	2		
ES-CA		2	1
SE	9		
CH	6		
UK-EN	7	9	12

Table A6.2. **ARWU Ranking positions of universities in 2014 (analyzed year):
breakdown by clusters**

Universities	ARWU 2014 ranking
CLUSTER 1	
Aarhus University	74
Catholic University of Leuven	96
Chalmers University of Technology	301
Charles University in Prague	201
Ghent University	70
King's College London	59
Linköping University	301
Lund University	102
Norwegian University of Science and Technology	201
Royal Institute of Technology	201
RWTH Aachen University	201
Stockholm University	78
Swedish University of Agricultural Sciences	201
Swiss Federal Institute of Technology of Lausanne	96
Swiss Federal Institute of Technology Zurich	19
Technical University of Denmark	102
The Imperial College of Science, Technology and Medicine	22
The University of Manchester	38
Umeå University	201
University College London	20
University of Antwerp	301
University of Basel	90
University of Bern	152
University of Bochum	201
University of Bonn	94
University of Bristol	63
University of Cambridge	5
University of Copenhagen	39
University of Duisburg-Essen	301
University of Gothenburg	152
University of Helsinki	73

Universities	ARWU 2014 ranking
University of Innsbruck	201
University of Koeln	152
University of Lausanne	152
University of Liege	201
University of Muenster	152
University of Oslo	69
University of Oxford	9
University of Southern Denmark	301
University of Vienna	152
University of Zurich	56
Uppsala University	60
Vrije University Brussel	301
CLUSTER 2	
Aix-Marseille University	102
Autonomous University of Barcelona	201
Cardiff University	102
Claude Bernard University Lyon 1	201
Delft University of Technology	201
Eindhoven University of Technology	301
Erasmus University	152
Leiden University	77
London School of Economics and Political Science	102
Radboud University Nijmegen	102
Technical University Darmstadt	401
The University of Sheffield	102
Trinity College Dublin	152
University of Amsterdam	102
University of Barcelona	152
University of Bologna	152
University of Bordeaux 1	201
University of Frankfurt	102
University of Groningen	82
University of Leeds	102

Universities	ARWU 2014 ranking
University of Liverpool	102
University of Lorraine	201
University of Maastricht	201
University of Milan	152
University of Nottingham	102
University of Padua	152
University of Paris Descartes (Paris 5)	152
University of Paris Sud (Paris 11)	42
University of Roma — La Sapienza	152
University of Southampton	102
University of Sussex	152
University of Twente	301
University of Wageningen	102
University of Warwick	152
Utrecht University	57
VU University Amsterdam	100
CLUSTER 3	
Aalborg University	401
Aalto University	401
Brunel University	401
Ecole Polytechnique	301
Lancaster University	301
Newcastle University	201
Polytechnic Institute of Milan	201
Polytechnic University of Catalonia	401
Queen Mary, University of London	201
The University of Reading	301
University College Dublin	201
University of Bath	401
University of Bielefeld	401
University of East Anglia	152
University of Eastern Finland	401
University of Essex	401

Universities	ARWU 2014 ranking
University of Exeter	201
University of Graz	401
University of Leicester	201
University of Nice Sophia Antipolis	401
University of Oulu	301
University of Paris Dauphine (Paris 9)	301
University of Rennes 1	401
University of Surrey	401
University of Turku	301
University of York	201
Vienna University of Technology	401

The Myth about Universal Higher Education: Russia in the International Context

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Abstract. It is widely believed that higher education in Russia has become almost universal and more people go to universities in Russia compared to most European countries. In this paper we explore this issue empirically with the Russian and European census data and the data from the Trajectories in Education and Careers (TREC), a longitudinal cohort study. According to the 2010 census, only 34% of people aged between 25 and 34 in Russia have university degrees, which is near-

ly the same as in most Eastern European countries and slightly fewer than in Western Europe. The TREC data show that only about 50% of 2012 ninth-grade graduates were university students in 2015. The expansion of higher education in Russia has been in line with the overall European trends. Similar to other countries, there have been changes to the gender composition of university students in Russia over the last two decades, with girls being more likely to attend university than boys. The analysis of social backgrounds of students with different educational trajectories reveals a considerable social inequality within the Russian education system. Eighty-four percent of school graduates with university-educated parents are admitted to university, as compared to only 32% of children from less-educated families. Graduation from ninth grade represents an educational fork that is crucial for inequality, as children from less socially advantaged families tend to opt for vocational education at this stage. Graduation from eleventh grade is a less important educational transition: at least 80% of high school students get admitted to university after graduating from 11th grade.

Keywords: educational inequality, education transition, higher education, longitudinal study.

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The belief that higher education in Russia has become almost universal is one of the most curious and important misperceptions shared by the public concerned as well as an essential part of the expert community. This belief has become almost axiomatic in recent years, being supported by a broad consensus, consistent with public expectations and instincts, and illustrated by out-of-context statistics in the best case. Experts disagree in assessing the scale of the “disaster”—rates of higher education attainment in Russia—sometimes going as far as an absurd 90%, as in the statements made by Sergei Ivanov, former Presidential Administration Chief of Staff¹, or Igor Kholmanskikh, Presidential Envoy to the Ural Federal District². Researchers keep up with politicians on this issue, always eager to incorporate the statement about universal higher education into their arguments [Klyachko 2016].

The increasing spread of higher education is often perceived from a regulatory, mostly negative point of view. Massification of higher education is no good because it implies degradation of education quality by default, as if it was under the law of conservation of matter. Mass higher education is a sheer waste of government funds that could be spent more wisely. In the end, massification causes structural damage to the economy: for example, the proliferating sector of Russian education is referred to as “malignant higher education” in an article by Vyacheslav Inozemtsev [Inozemtsev 2016].

So, why is this misperception so persistent? The myth of universal higher education in Russia originates from a number of sources. Some of them are related to social experience and intuitive reasoning of experts and the public at large, while others have to do with commonplace abuse of statistics. First of all, education is most often discussed by people from the most educated social tiers, where, indeed, nearly all high school graduates enroll in university. Secondly, participation in higher education is actually increasing in Russia just as in many other countries. Thirdly, many believe that higher education attainment rate corresponds more or less with the proportion of high school graduates enrolled in college, so about 40% of middle school graduates enrolled in trade schools and vocational colleges are simply left out. This article provides an insight into the extent to which Russians actually participate in higher education, whether these rates are high or not, and how they change and correlate with international practices.

The regulatory aspect of massification of higher education—both imaginary and real—is a complex phenomenon, which could make a

¹ Sergei Ivanov reports an excess of colleges in Russia / Interfax. June 16, 2016. <http://www.interfax.ru/russia/513813>

² Kholmanskikh calls on youth to give up on higher education / Interfax. June 18, 2012. <http://www.interfax.ru/russia/251046>

separate study. This paper provides a brief initial assessment of the correlation between participation rates in higher education and the economic structure. In doing so, it is necessary to keep in mind that it is not only purely economic effects but also the fundamental social and cultural mechanisms underlying the key institutional settings of today that education is associated with.

The flip side to this myth is the lack of attention to transitions after middle school, i. e. at the first formal fork of trajectories in Russian education. This article shows that the middle school graduation fork is a more important factor of social inequality than the stage of moving from high school to college. The article provides a close analysis of these two transitions and their effects, contemplating the institutional, social and economic mechanisms behind the choices made by people on the threshold of their career trajectories.

The article is structured as follows. First, we discuss the literature on the massification of higher education in Russia and abroad as well as social inequality in Russian education. Further on, we analyze Russian and EU census data to compare the proportions of the college-educated population. The next part confirms the key findings using the longitudinal study Trajectories in Education and Careers (TrEC) and probes the social inequality that manifests itself during transitions at different levels. In the conclusion we try to figure out to what extent the existing stereotypes about higher education in Russia describe reality.

Massification of higher education and educational inequality in Russia and abroad

As the data analysis shows below, massification of higher education is not an exclusively Russian phenomenon. Martin Trow was among the first to address this issue [Trow 1974]. He divided higher education into three tiers—elite (up to 15% of the relevant age grade), mass (15–50%) and universal (over 50%)—and showed how mass and universal higher education comes to replace the elite system in developed countries³. Trow also analyzed how the spread of mass higher education affected the role and structure of university and social inequality in education [Trow 2007]. In particular, he established that as higher education systems expand, social inequality manifests itself not only in access to higher education but also in the quality and standards of universities entered by students from different social strata. In this regard, his approach is consistent with the conception of effectively maintained inequality offered by Samuel R. Lucas [Lucas 2001].

Evan Schofer and John W. Meyer performed a statistical analysis of international data to find out the reasons for the global expansion of higher education in the second half of the 20th century [Schofer, Mei-

³ However, Trow argues, elite educational institutions are preserved despite the spread of mass and universal education.

er 2005]. Expansion of higher education is a global trend whose rates of growth accelerated in developed countries in the 1960s. Higher education systems grew more rapidly in countries with a greater expansion of secondary education, i. e. where more secondary graduates were willing to enter college. Strong governmental control over higher education slowed down the expansion, all other factors held equal. The rates of growth accelerated in virtually all developed countries at the same time, which Schofer and Meyer explain by not so much economic reasons as the global spread of the new societal model based on democratization, scientization and national development planning. Patricia Yu and Jennifer Delaney carried out a cross-country analysis of the factors affecting the spread of higher education based on the new data for 1999–2015 [Yu, Delaney 2016] to arrive at conclusions similar to those made by Schofer and Meyer.

The expansion of higher education and associated socioeconomic inequality in Russia have been analyzed by Anna Smolentseva. In her research, she draws from Trow's conception of massification of higher education. Extramural education, or evening classes, has become the driving force for this process in Russia. The proportion of students enrolled in this type of higher education was 42% in the Soviet Union, and now it has increased to 53% [Smolentseva 2017:216]. Another factor that provoked the spread of higher education was the introduction of tuition-based educational services, in particular by public colleges. Tuition fees are paid today by 61% of college students [Ibid.:212]. Smolentseva concludes that expansion of higher education has only partly reduced the inequality in access to it between groups with different socioeconomic backgrounds, as high-end universities attract students from more educated families.

Ilya Prakhov [2015] shows that the Unified State Examination has not ensured equal access to quality higher education. The choice of a selective college (with competitive admission to government-funded places and high quality of teaching) is determined not only by universal state examination (USE) scores but also by the socioeconomic status, the type of secondary school completed, and the amount invested in preparation for the USE. Student populations differ in their social and educational backgrounds across colleges of different selectivity. That is why, despite massification of higher education, access to quality higher education is limited for students from families of low socioeconomic status.

Publications by American and Russian sociologists reveal that the level of social inequality in access to education was rather high in the Soviet Union, contrary to the popular myth [Gerber, Hout 1995; Konstantinovskiy 2012]. According to Theodore P. Gerber [Gerber 2000], social inequality in access to high school increased in the 1990s, while accessibility of higher education remained the same.

Longitudinal data indicate that inequality in access to higher education develops gradually, as students move along their education-

al trajectories, and affects future careers [Konstantinovskiy 2012; Kosyakova et al. 2016]. A panel study of high school graduates in Novosibirsk Oblast (1998–2008) shows that the type of educational institution that respondents graduate from “at the start” has a great impact on subsequent career trajectories [Konstantinovskiy et al. 2011; Cherednichenko 2014]. A great deal of socioeconomic inequality is observed at the stage of transition from middle school, children from more advantaged families being more likely to move to high school than to opt for vocational education.

Studies based on the Trajectories in Education and careers (TrEC) data find that students from more educated and affluent families tend to enter the “academic track” of moving from middle to high school. Both primary and secondary effects of social inequality manifest themselves in this transition. Children from more advantaged families show on average better academic achievements (primary effects); however, among children with similar levels of knowledge and competencies, the chances of getting onto the “academic track” will still be better for children from families with higher socioeconomic status (secondary effects) [Bessudnov, Malik 2016; Kosyakova et al. 2016]. Other factors also contribute to the accumulation of socioeconomic inequality, such as the choice of schools with differing teaching standards and education programs (gymnasium, lyceum, specialized school, or regular school) by representatives of different social strata [Kosyakova et al. 2016].

A number of studies explore trajectories of students outside the conventional “academic track” (from high school to college), who nevertheless engage or plan to engage in higher education. For instance, many middle school graduates first go to vocational schools and then to college. The popularity of this trajectory, as Daniil Aleksandrov and his co-authors believe, is explained by the desire to alleviate risks and get easier access to college without taking the USE exam. This strategy is typical of average performers from regular schools, whose families seek to enhance their social status despite their limited socioeconomic and educational resources [Aleksandrov, Tenisheva, Savelyeva 2015].

Another publication studies young workers aspiring for higher education [Voznesenskaya, Cherednichenko 2012]. Most young workers from low socioeconomic and educational backgrounds keep to “horizontal” trajectories, showing more concern for stability and no motivation to pursue higher education. Using interviews with another group of workers—with college degrees or still enrolled in college—the authors demonstrate that obtaining higher education while working full time has no significant effect on career trajectories if not supported with other resources, yet it becomes a personal and cultural social resource for career advancement with the current employer.

How many people in Russia have college degrees

Most declarations on the universal nature of higher education in Russia draw from the OECD statistics [OECD2012], which claims that 54% of the Russian population aged 25–64 has completed *tertiary education*. The term *tertiary education* is often translated into Russian as “higher education”, which is inaccurate as OECD statistics brings together college-educated people and vocational school graduates. Russia’s higher education is classified as ISCED5A according to the international standards, while vocational education corresponds to ISCED5B. In fact, Russia would not be in the top of this specific ranking of OECD countries if it was not for the wide spread of vocational education. However, bringing together graduates from vocational schools and colleges is incorrect in the light of the Russian education system’s characteristics. The OECD uses national data for its reports and has no independent sources of its own.

So, how many people with university degrees are there in Russia? According to the 2010 census, which is the most comprehensive source of data on the Russian population, 27% of people aged between 25 and 64 hold university degrees, 3% have certificates of incomplete higher education (having dropped out of university), and 36% have diplomas of vocational schools. The proportion of the university-educated population is higher in the age cohort of 25–34-year-olds, comprising 34%. Yet, even this latter rate is far below those reported by the mass media.

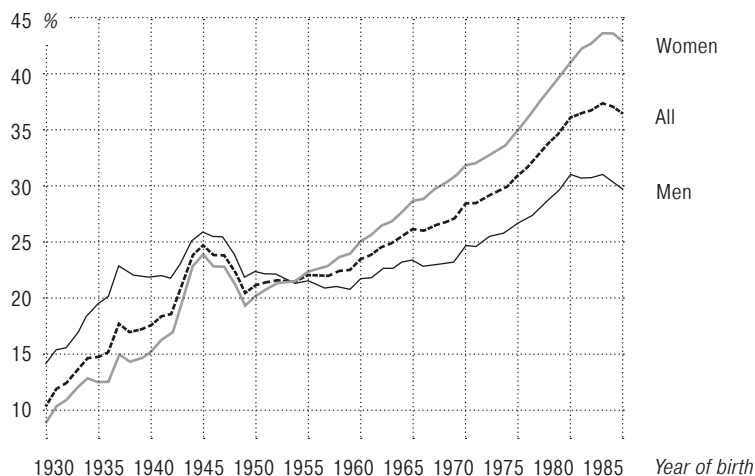
Figure 1 presents the proportions of university-educated men and women in different age cohorts based on the 2010 census. The graph indicates that the percentage of the university-educated population was constantly growing throughout the postwar period. This growth is especially noticeable beginning from the cohort of those born in 1960, who mostly obtained higher education in the late 1970s–early 1980s. Therefore, expansion of higher education started back in the Soviet times and cannot be regarded as an exclusive attribute of the post-Soviet period. Moreover, as shown below, it has been perfectly in line with the global trends⁴.

Another trend that follows from the graph is the increasing gap between the rates of university-educated men and women. Men used to obtain higher education more often than women in the cohort of those born before 1955. However, the situation is reverse in younger cohorts, the gap constantly growing and reaching its peak of 10% in the cohort of the population born in 1980. This trend is not specific of Russia either, as shown below.

Many people look to their immediate experience and social environment instead of statistics when developing their opinions about social problems and facts. The proportions of children enrolling in univer-

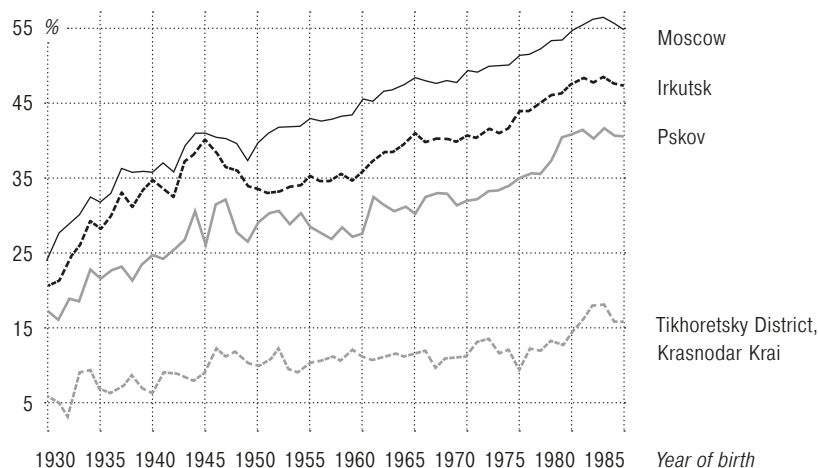
⁴ small decrease in the proportion of university degree holders in the youngest cohorts is explained by the fact that some representatives of those cohorts were still enrolled in college in 2010.

Figure 1. **Proportions of college-educated population in different age cohorts** (*Percentage of university-educated population*).



Source: 2010 Russian census.

Figure 2. **Proportions of college-educated people in the population of four regions of Russia** (*Percentage of university-educated population*).

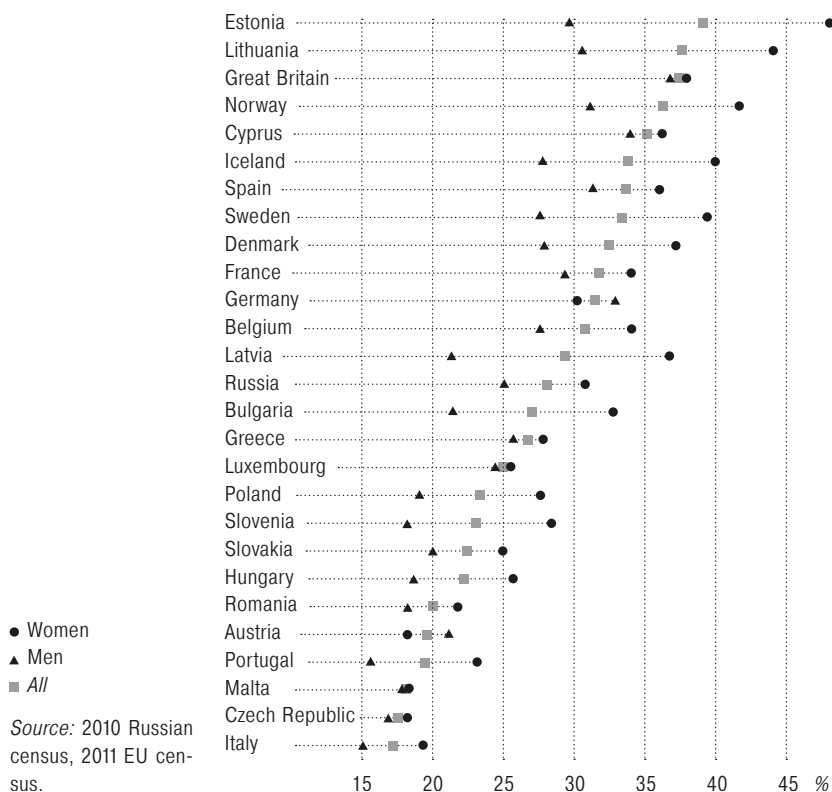


Source: 2010 Russian census.

city are considerably higher in large cities and educated families than Russia's average rates. Figure 2 shows how the proportions of university-educated people in the populations of Moscow, Irkutsk, Pskov and Tikhoretsky District of Krasnodar Krai have changed over time. These regions have been chosen to demonstrate the differences between a megalopolis, a large and small regional capital, and a rural locality.

However, one must be careful in interpreting this graph, as it shows the proportion of university-educated people living in the selected regions as of the 2010 census without any allowance made for

Figure 3. **The percentage of college-educated population among 25–64 year-olds in European countries.**



cross-regional mobility or mortality rates in senior cohorts. People from rural settlements who obtain higher education are likely to stay in the city after completing their education. Still, the graph reveals considerable differences in the percentage of university-educated people across regions. The larger the city, the more educated people make up its population. While the proportion of the university-educated population in young cohorts is over 50% in Moscow, it hardly reaches 20% in the Tikhoretsky District of Krasnodar Krai.

Is it true that Russia is far ahead of most other European countries regarding the rate of participation in higher education? Figure 3 provides data on the proportion of the university-educated population in the cohort of 25–64-year-olds in Russia (based on the 2010 census) as compared to other European countries (based on the 2011 EU census⁵).

As can be seen from the graph, there are wide gaps in university participation rates between the countries. On the whole, the rates

⁵ See <https://ec.europa.eu/CensusHub2/>.

are higher in more economically developed countries (United Kingdom, Scandinavia, Spain, France, Germany), yet there are exceptions to this rule, e. g. the rate is lower in Italy than in any other European country. Estonia and Lithuania show the highest percentage of university-educated people. The same two countries, along with Latvia, demonstrate the widest gender gap, women being much more likely to have university degrees than men. On the whole, the proportion of university-educated women is higher than that of men in all European countries except Germany and Austria.

Russia's university participation rate is lower than most developed countries, being at around the same level as Latvia, Bulgaria and Greece.

Figure 4 demonstrates the dynamics of university participation rate growth in Russia as compared to five other European countries: Latvia, Romania, Poland, Germany and Great Britain. The dynamic is similar across the four post-socialist countries (Russia, Latvia, Poland and Romania), featuring a sharp increase in the proportion of university-educated population beginning approximately with the cohort of those born in 1950 and an outstripping growth in the percentage of university-educated women. UK's university participation rate is higher than Russia, but its active growth began later, roughly with the cohort of the population born in 1970. This was caused by a steep increase in providers in England's higher education market in the 1990s and by the conversion of former polytechnics into universities. Gender differences in the university participation rate are also lower in the UK than in Russia.

Germany is an exception to the general rule, being a country with a developed system of vocational education. The proportion of university-educated men is noticeably higher in Germany than in other European countries, yet it has not increased in younger cohorts. The percentage of university-educated women increased perceptibly and exceeded that of university-educated men in the youngest cohorts. The decrease in university participation rates among the youngest is explained by "late" graduations: not all the population born in 1980 or younger had completed their education by the 2011 census.

On the whole, this analysis shows that processes in Russian higher education are not unique but quite consistent with the common European and global trends. Russia differs little from Eastern-European countries in the proportion of university-educated population and is still behind most countries of Western Europe. The growing university participation rates in younger cohorts are typical, again, of most countries, just as the higher rates among women as compared to men. Russia is not alone in debating the expansion of higher education. The belief that "too many" young people enroll in universities is also popular in Great Britain⁶.

⁶ Are there too many people going to university? // The Telegraph. June 19,

Figure 4. **Participation rates in higher education across different age cohorts in six European countries** (*Percentage of university-educated population*).



**Participation rates
in higher education
and the economic
structure**

It is not enough to compare proportions of university-educated population across different countries. It is more important to what extent the percentage of university graduates is consistent with a specific country's need for an educated labor force. The economic structures of some countries are dominated by industries that require highly qualified labor, hence university-educated staff. If the British economy feels a greater need for a university-educated labor force than the Russian one, it can be suggested that Russian universities "overproduce" graduates, provided that the proportions of university-educated population are relatively the same in both countries.

A detailed economic analysis is required to test this hypothesis. As the first step in this analysis, the ratio between the rate of the university-educated population and that of managers and professionals is estimated. These two occupational groups (major groups 1 and 2 according to the International Standard Classification of Occupations) are the first to require university qualifications. University degrees were held by 27% of the Russian population aged between 25 and 64 in 2010. According to the Russian Longitudinal Monitoring Survey carried out by National Research University—Higher School of Economics (RLMS—HSE), about 30% of the employed population aged between 30 and 64 worked as managers or professionals in 2010⁷. Therefore, the ratio of the proportion of university-educated population to that of managers and professionals was 0.9. Otherwise speaking, on average 9 out of 10 managers and professionals had university degrees in Russia in 2010.

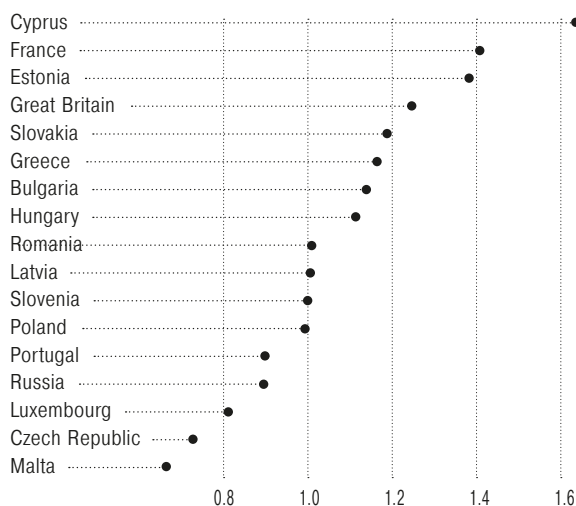
Figure 5 presents the same index for some other European countries. As we can see, Russia lags behind most of them: there are approximately 12 university-educated people per 10 managers and professionals in Great Britain, 14 in France, and about 10 in Latvia and Poland.

These estimates are preliminary and have some limitations, so a full-fledged analysis of the education system conformance to the labor market needs still awaits its researchers. Nonetheless, the analysis performed in this article shows that there is no reason to claim that the percentage of the university-educated population is abnormally high in Russia. In fact, Russia's rate of participation in higher education is similar to that of Eastern-European countries, being lower than most of Western Europe.

2016. <http://www.telegraph.co.uk/education/2016/06/19/are-there-too-many-people-going-to-university/>; Degree degradation: With too many university graduates and not enough jobs, many are finding themselves woefully underemployed // The Independent. August 19, 2015. <http://www.independent.co.uk/voices/editorials/degree-degradation-with-too-many-university-graduates-and-not-enough-jobs-many-are-finding-10461190.html>

⁷ Instead of the ISCO, the related European Socio-economic Classification (ESeC) was used to analyze the Russian data (see [Bessudnov 2016]).

Figure 5. **The ratio of the proportion of college-educated people to that of managers and professionals in employed population** (*% of college-educated people / % of managers and professionals*).



Source: 2010 Russian census, 2011 EU census, RLMS data.

Educational trajectories of secondary graduates based on the panel study Trajectories in Education and Careers

National census data allow for measuring the proportions of people with different levels of education in different generations, yet it is not suitable for a more detailed analysis. Besides, it has been seven years since the last census, so the data available are insufficient to assess the educational trajectories of recent school graduates. The results of the panel study Trajectories in Education and Careers (TrEC) [Bessudnov et al. 2014; Kurakin 2014] are used to perform a more comprehensive analysis of educational trajectories pursued by recent secondary graduates as well as to verify the census data.

The sample for the national panel included eighth-graders who participated in the Trends in Mathematics and Science Study (TIMSS) in 2011. TIMSS-2011 participants, or 4,893 students from 210 schools in 42 regions of Russia, provided the initial sample for the longitudinal study conducted by National Research University Higher School of Economics (NRU HSE) since 2012. In addition to systematic surveys, the same young people took part in the Programme for International Student Assessment (PISA) in 2012 as an additional sample. This way, a unique panel was provided, containing data on the participants from two different international assessment systems.

At the moment of writing this article, data had been collected in five waves of the national panel study in addition to TIMSS and PISA surveys. This analysis will only use the results of the first four waves (2012–2015), whose data collection characteristics will be briefly described below. Data of the fifth wave, carried out in 2016, will be used for future publications. The first wave took place in spring 2012 and

covered TIMSS-2011 participants, who were ninth-graders at that time, and their parents. The second and third waves were held in autumn 2013 and in spring 2014, when the participants were eleventh-graders or students of vocational schools, mostly in their second year. The fourth wave was conducted in autumn 2015, when most respondents were already enrolled in university (second-year students mostly) or vocational schools. Table 1 describes the wave schedule, educational attainment of respondents, and sample retention rates.

Predetermined by the initial sample structure, the methodology of collecting longitudinal data later changed depending on the status and availability of respondents. In the course of TIMSS, whose methodology implies first sampling schools and then classes, participants filled out test and questionnaire forms at the schools that they attended. The PISA and the first wave of the panel study were conducted in the same way a year later. The PISA surveyed 90% of TIMSS participants, and the first wave of panel data involved 69% of the initial sample (for more information on the data collection process and the causes of attrition in the first wave, see [Bessudnov et al. 2014]).

When the second and third waves were carried out two years later, some of the respondents had already left schools and enrolled in institutions of vocational education. To reach out to as many respondents as possible, school data on trajectories of middle school graduates was collected and face-to-face or telephone interviews were used to survey respondents who were not enrolled in TIMSS-sampled schools anymore. The TIMSS sample retention rate was 84% and 87% in these two waves, respectively. Beginning with the second wave, data has been collected by the Public Opinion Foundation.

The fourth wave had to make allowance for the changes in respondents' status that took place during the previous 18 months. All participants were now secondary graduates, many were enrolled in university, and many have moved homes. As the respondents were not all available in the same location, computer assisted web interview (CAWI) became the main survey method. Interviewers contacted the panel participants in advance and sent them a link to the questionnaire. Where necessary, contacts were repeated. Respondents unable or unwilling to fill out the online questionnaire for whatever reason were interviewed on the phone. The overall sample of the fourth wave included 3,618 respondents, or 74% of the initial sample.

In our previous publication [Bessudnov, Malik 2016], we used TrEC data to analyze social and gender inequality in the educational choices of middle school graduates. It was found out that around 57% of middle school graduates moved to high school and 43% went to vocational schools. Students proceeding to high school showed considerably better performance and higher proportions of girls and children from more educated and affluent families. It was also demonstrated that students from more socially advantaged families had much bet-

Table 1. The description of waves of the national panel study Trajectories in Education and Careers.

Wave	Year	Respondents	Educational attainment	N	Initial sample (TIMSS-2011) retention rate
TIMSS	Spring 2011	Respondents (test and questionnaire) Teachers of mathematics and natural sciences, school management	8th grade	4,893	100%
PISA	Spring 2012	Respondents (test and questionnaire) School management	9th grade	4,399	90%
1st wave	Spring 2012	Respondents and their parents (mothers mostly)	9th grade	3,377	69%
2nd wave	Autumn 2013	Respondent questionnaire Collection of school management's data on trajectories after middle school	Last year of high school or 2nd grade of vocational school	4,138	85%
3rd wave	Spring 2014	Respondent questionnaire	Last year of high school or 2nd grade of vocational school	4,239	87%
4th wave	Autumn 2015	Respondent questionnaire	Enrolled in college or vocational school	3,618	74%

Source: TrEC.

ter chances of moving to high school, academic achievement indicators held equal.

The previous publication used TrEC data collected in 2011–2013. In this article, we also add data collected in 2015, when all of the participants of the panel study had already graduated from secondary school and moved to the next stage. This data allows for analyzing the transition from secondary school to university and measuring the proportion of students opting for this educational trajectory.

Table 2 provides information on educational trajectories of the panel study participants in 2010–2015.

The first two columns show the number and the proportion of students choosing different educational trajectories in the total sample including non-respondents. Some of the students could not be interviewed in 2015, which is usual for longitudinal studies. The third column displays the distribution of trajectories for actual respondents only. The fourth column shows the distribution corrected for the weight coefficient reflecting the likelihood of dropout from the survey due to specific participant characteristics. This latter column is the most accurate picture of the distribution of students across educational trajectories. The last two columns describe the relevant percentages of boys and girls in the distribution.

As seen from Table 2, only about 47% of middle school graduates move on to high school and then to university. This data is con-

Table 2. **The distribution of students across educational trajectories (%)**.

Educational trajectory	N	Percentage	Percentage with non-respondents excluded	Weighted percentage	Percentage among boys	Percentage among girls
High school → university	1,890	39	53	47	42	53
Middle school → vocational school	792	16	22	25	29	20
High school → N/A	608	12				
Middle school → vocational school → N/A	567	12				
Middle school → vocational school → not enrolled	303	6	8	10	12	8
High school → vocational school	235	5	7	7	5	9
High school → not enrolled	189	4	5	5	8	3
Middle school → not enrolled → N/A	120	2				
Middle school → vocational school → university	76	2	2	2	1	3
Middle school → not enrolled	39	1	1	2	1	2
Other	74	1	2	2	2	2
Total	4,893	100	100	100	100	100

Source: TrEC

sistent with the proportion of the university-educated population in the youngest cohorts based on the 2010 census, thus proving its reliability. Nearly 40% of the cohort moved to vocational schools after graduation from the ninth grade. In 2015, 25% of them remained in the vocational education system (which corresponds to four-year programs). Ten percent were not doing any studies at the time of the survey in 2015, having probably completed two-year vocational programs. Two percent of the respondents enrolled in university after graduation from vocational schools. This category will expand in the future by including graduates from four-year vocational education programs [Aleksandrov, Tenisheva, Savelyeva 2015]. Data on this category will be available in the TrEC waves to come.

About 7% of the cohort enrolled in vocational schools after graduation from high school. Another 5% were not enrolled anywhere after high school, some of these having entered the labor market and others preparing for university or trade school.

This data thus indicates that Russia has developed an education system where transition after middle school is the main “fork” determining educational trajectories. TrEC data demonstrate that about 80% of those who move on to high school enroll in university after-

wards, as compared to only about 35% of vocational school students [Shugal 2010]⁸.

Analysis of educational trajectories should also involve taking into account that universities and majors within them differ in the quality of teaching and the level of associated social prestige. These differences are known as horizontal stratification in literature [Gerber, Cheung 2008]. TrEC data allow for analyzing horizontal stratification in Russia, but such analysis is beyond the scope of this article and would require a separate study.

Educational trajectories of boys and girls participating in the panel study differ significantly. Only about 42% of boys enrolled in university after high school, as compared to 53% of girls. In addition, boys are more likely to leave school after graduation from the ninth grade, while girls move to the vocational education system after high school more often than boys. Figure 6 illustrates the distribution of boys and girls across the educational trajectories.

Table 3 describes the academic performance of students with different educational trajectories (five groups cumulatively account for 96% of the sample). TIMSS and PISA tests were passed in the 8th and 9th grades (2011–2012). The best performance was shown by students who would move to high school and then to university, followed at a great distance by students who would choose vocational education after high school and those who would not enroll anywhere after school. The worst performance was demonstrated by students who would move from middle to vocational school, especially those who would enroll in two-year vocational education programs.

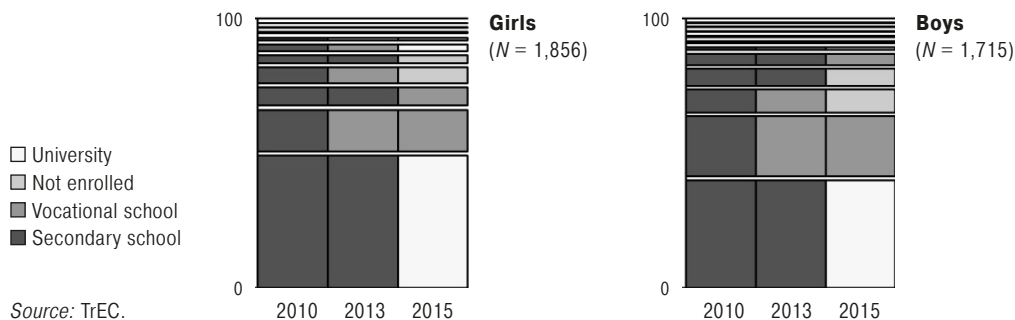
All high school graduates who enrolled in university had taken the USE exam. The proportion of USE takers is 90–95% among high school graduates who did not enroll in university and only 10–20% among those who left school as middle school graduates. In the latter group, the USE was only taken by students with stronger educational ambitions who probably envisaged going to university. These educational intentions also explain the relatively high USE scores among exam takers in this group (much higher than among high school graduates who did not go to university).

All in all, 70% of girls and 60% of boys in the sample took the USE exam. The mean sample USE scores are 50 points in mathematics and 66 points in Russian. As USE scores were reported by students themselves, the values are somewhat higher than the 2014 official USE results (40 points in mathematics and 63 points in Russian).

Table 4 describes the social characteristics of students in different educational trajectories. Students from families with monthly house-

⁸ One must keep in mind while interpreting this data that not all middle and high school graduates aspire for higher education. Meanwhile, students' vision of the best possible educational trajectory reflects their social background, being itself indicative of social inequality in education.

Figure 6. **The distribution of boys and girls across educational trajectories**
 (only respondents for whom comprehensive data is available, %).



Source: TrEC.

Table 3. **Academic performance of students with different subsequent educational trajectories.**

	Proportion of USE takers (%)	Mean USE score (among exam takers)		TIMSS score		PISA score		
		mathe-matics	Russian	mathe-matics	science	mathe-matics	science	reading
High school → university	100	52	70	573	572	526	521	511
Middle school → vocational school	12	47	55	509	518	453	459	437
Middle school → vocational school → not enrolled	18	48	57	482	492	427	433	407
High school → vocational school	95	38	55	522	526	461	462	448
High school → not enrolled	89	40	54	531	530	488	475	449
Mean sample value	65	50	66	539	543	487	486	470

Source: TrEC. Weighted estimates are presented.

hold incomes of less than 20,000 rubles in 2011 are less likely to go to university. However, the most important factor affecting student trajectories is parental education. Less than 5% of students who moved from middle to vocational school have university-educated parents, as compared to 23% of high school graduates enrolled in universities.

The data in Table 4 may also be presented as follows: 84% of students from university-educated families graduate from high school and enter university, as compared to 32% of children from non-university-educated families, of whom 55% move from middle school to trade schools and vocational colleges. Among gymnasium and lyceums high school graduates, 73% enroll in university, as compared to 38% of graduates from regular schools. University students show

Table 4. **Social characteristics of students in different educational trajectories.**

	Percentage of graduates / students					Girls
	Gymnasiums / lyceums / specialized schools	Families with monthly household income of less than 20,000 rubles, 2010	Both university-educated parents	Both non-university-educated parents	Studying in regions different from where they graduated from secondary school, 2015	
High school → university	54	34	23	29	29	57
Middle school → vocational school	21	57	4	45	14	42
Middle school → vocational school → not enrolled	23	58	1	56		41
High school → vocational school	24	61	4	52	17	65
High school → not enrolled	28	50	10	41		32
Mean sample value	37	46	13	39	23	51

Source: TrEC. Weighted estimates are presented.

greater cross-regional mobility than those not enrolled in higher education: nearly one third of them enroll in universities in a region different from where they graduate from secondary school.

In other words, a high level of social differentiation among students pursuing different educational trajectories is observed. What it means for the Russian education system as a whole is analyzed in the conclusion.

Conclusion

This article was inspired by the desire to overcome the existing stereotypes in the public mind about Russia's phenomenally high participation rate in higher education. A common assertion in mass media and public discussions is that over half the population of Russia has university degrees, whereas the actual proportion of university-educated people varies from one fourth to one third of the population, depending on the age cohort. This article seeks to show that these misperceptions, so widespread in both popular and expert discourse, jeopardize the development of the educational science, public discussion and social policies. In practical terms, overcoming these stereotypes means solving—on the macrolevel—the critical issues around the relation between inequality and education and—on the microlevel—the problems of building educational trajectories that are vital for millions of people.

Education is regarded as the key social institution that contributes to the alleviation or, vice versa, reproduction of socioeconomic

inequality. Inequality accumulation or alleviation together with the fundamental mechanisms of social mobility are the pivotal problems for the economy and social life, shaping the social environment and life prospects of individual people to a large extent. Fair and unambiguous game rules in education and in the labor market, allowing the most talented and hardworking to overcome the inherited social-class limitations, contribute to the legitimacy and effectiveness of major national institutions as well as alleviate social tensions.

One of the key characteristics of the education system in terms of inequality is how rigid and formalized the “tracking” is, i. e. how early the split into the “academic” and “vocational” tracks happens and to what extent they are mutually penetrable (i. e. to what extent transitions between the tracks are possible). Experts classify the Russian education system as one with a moderate “tracking index” [Bol et al. 2014]. As compared to highly-tracked education systems, where future trajectories are institutionally formalized and determined early on in educational careers, in moderately-tracked systems much depends on established practices, i. e. the specific entrenched combinations of institutionally mandated regulations and cultural and economic behavioral patterns in different social groups. Such systems are largely “slack”, meaning that they can both be more meritocratic than strongly-tracked ones and at the same time exacerbate the reproduction of the existing socioeconomic inequality patterns. In other words, it is not formal rules as such but how people actually use them that plays the pivotal role. A question comes to the fore as to which branch points of educational trajectories the events with the longest-playing effects for life, career and inequality reproduction/alleviation happen.

This sophisticated picture is largely distorted and trivialized by the belief that most or even the overwhelming majority of secondary school graduates go to university. This belief implies a low level of inequality differentiation at all education stages: since all or almost all go to university, inequality must develop outside the education system. The reality, however, is different: the 2010 census found the proportion of university-educated people in Russia to be barely reaching 27% in the cohorts of 25–64-year-olds and 34% among the population aged between 25 and 34. The rates have increased somewhat since then but remained comparable. According to TrEC data, only 47% of 2012 middle school graduates enrolled in universities. As we can see, the inequality in the education system is generated in several key points. There are three such points: transition after middle school (the first formal fork in Russian education), transition after high school, and transition after graduation from vocational schools.

Transition after middle school is the most crucial fork for inequality reproduction. About 40% of middle school graduates go to vocational schools; only a small proportion of them will later go to university, and many of them will study extramurally, while working full time. Most high school graduates, conversely, will enroll in university, most

often in full-time programs. Therefore, this earliest fork is the most important one, which partly offsets the compensation capabilities typical of moderately- or low-tracked education systems.

In addition, this very first fork is social-class-tinged. For instance, only 5% of students with both parents university-educated go to vocational schools after graduating from middle school, as compared to over 50% of children from non-university-educated families. Research in this area has shown that the choice of track is influenced by both the primary and secondary effects of inequality according to Raymond Boudon's classification, as well as by informal differences in the choice of curricular tracks throughout primary and middle school [Bessudnov, Malik 2016; Kosyakova et al. 2016]. In such a way, the myth of universal higher education camouflages the real situation with inequality, mechanisms of its reproduction, and social mobility.

Thus, overcoming the myth of universal higher education has important implications, being indispensable for ensuring an adequate understanding of inequality in education. The problem goes beyond scholarly discussion because debates on education that are based on stereotypes instead of research findings abolish expertise as an element of educational policy, primitivizing public discussion and turning it into a contest of propagandist clichés.

Overcoming these misperceptions also reveals another essential aspect to this problem. Russia follows the global trends, with its participation rate in higher education being close to average European indicators and slightly behind most Western countries. Moreover, the fundamental macro trends in Russian education, namely the massification of higher education and the gender gap inversion⁹, are in line with the global trends both chronologically and in their scope. These changes in the structure of Russian education date back to the Soviet era and not the post-Soviet period to which all major socioeconomic shifts of the recent decades are often attributed. Contrary to the common beliefs about the isolated nature of Russian experience, the world turns out to be more global, in this regard too, than it is often believed to be, and these universal major trends in different countries date from earlier periods than the advent of the Internet or the fall of the "iron curtain".

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⁹ Men obtained higher education more often than women up until the 1970s, but the relationship became inverse later.

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Developing the Entrepreneurial University through Positive Psychology and Social Enterprise: A Case Study of Curriculum Innovation in Russia

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Abstract. This article provides an empirically-based insight into the operation and impact of socially-oriented entrepreneurship as an educational tool at the Russian Higher Education institution, ITMO University, St Petersburg. The experience suggests that consciously placing stress on the social and ethical dimension of entrepreneurship education provides a strong motivational factor which develops many students' interests towards contributing positively to society. The effective engagement of students in community projects creates a synergy between the project's practical objectives, students' awareness of self, and helps to refine the students' own life goals and values—invaluable for setting a career strategy.

Key words: higher education, entrepreneurship education, project management, socially-oriented entrepreneurship, the ITMO University, curriculum, motivation, students' life plans.

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1. Introduction The ITMO University¹ case study focuses on an educational experiment to merge entrepreneurship skills with social and community values and evaluate the impact on students' own personal development and their resulting behavioural changes. This type of bottom-up student-centered case study of socially-focused entrepreneurial education has rarely featured in the literature on entrepreneurialism in Higher Education. Case studies of entrepreneurship education, written by the practitioners themselves, have been limited, with the exception of the eleven case studies in Coyle et al. [2013]. The emphasis in the past has largely been on corporate entrepreneurialism in universities [Burns, 2005], 'triple helix' models, technology transfer ('research output into society') processes and defining the place of entrepreneurship education in top-down 'Third Mission' initiatives and its relationship to *knowledge exchange* [Hagen, 2008]. Examples of socially-oriented entrepreneurial education in Russia, with insights and illustrations of entrepreneurship and innovation with a social outcome and community focus, are rare.

2. Entrepreneurial Education in the Literature There is much debate in the literature over the breadth of different interpretations of entrepreneurialism in Higher Education [Nelles, Vorley, 2010; Hagen, 2008]. In some countries, such as the UK, the entrepreneurial transformation of Higher Education became an issue for public policy [Godin, Gingras, 2000]. For example, this led to subsidies like the UK's Higher Education Innovation Funding (HEIF) (<http://www.hefce.ac.uk/kess/heif/>) designed to trigger commercialization processes in Higher Education, largely with the intention of more effectively transferring university inventions into the national economy.

This is not true in the Russian Federation. The most recent Russian federal investments in Higher Education have targeted the enhancement of research outputs (e.g. the 'National Research University' (NRU) program), rather than entrepreneurship education, and unam-

¹ ITMO University—St. Petersburg National Research University of Information Technologies, Mechanics and Optics—is one of the leading higher education institutions in Russia, providing training and research in advanced science, humanities, engineering and technology. Founded in 1900, it acquired the status of the "National Research University" in 2011 blending the culture of innovation and discovery with world-class education. It is located in the heart of St. Petersburg. The University serves over 13,000 students. Its 15 departments offer 104 bachelor degree programs, 39 specialist degree programs, 146 master degree programs, 45 additional training programs, as well as doctoral and postdoctoral programs. Some of its best-known research work is in Photonics, Fine Mechanics, Computer Science and Information Technology. ITMO University has been selected to become part of a distinguished group of Russian universities to participate in the "5 to 100" federal program aimed at helping them reach the top 100 ranking in the QS World University Ranking by 2020. It is also the only six-time champion of the World Championship in Programming (ACM International Collegiate Programming Contest).

biguously attempted to improve the ratings of Russian universities in global university rankings (e. g. the ‘5–100 Competitiveness-Growth’ program)².

A frequent criticism of entrepreneurialism in Higher Education is its overly narrow focus on top-down tendencies, and notably the five-element ‘entrepreneurial architecture’ of structures, systems, strategies, leadership and culture [Burns, 2005; Nelles, Vorley, 2010], which downplays entrepreneurial education despite its rapid growth in Italian universities [Riviezzo, Napolitano, 2010].

Shattock [2008] extended entrepreneurialism in universities beyond the mere economic to social and community development. Gibb [2013] places great emphasis on highlighting the growing pressures to broaden student experiential learning during the early part of the 21st century, particularly with the pressures to grow the small and medium enterprise sector of the economy, including social or community enterprises.

What is clear from the ITMO Case Study is that new ‘social enterprise’ ventures excite students with their societal or social purpose and have the added value of engaging with a wider range of social and community partners, including charities and organizations aimed at the public good.

This wider ‘social’ orientation, which is increasingly evident in universities and involves significant interaction with not-for-profit organizations, is re-echoed by Baker [2013], who argues that, in his institution—Brighton University, UK—the commercial imperative of exploitation for university gain is not (and is unlikely to be) one that drives strategy or action in the future. He goes further by stating that *social engagement resonates strongly as a basis for the university’s pursuit of innovation* [2013:30].

Brighton University’s knowledge exchange is primarily determined by local, rather than, institutional need. There are other movements evident inside universities suggesting that entrepreneurship education is developing in different forms with a less utilitarian focus than has been the case in the past. This has been a tendency which has arisen more from within teaching-led public or community universities, whose mission is less determined by the research imperative, and where the teaching focus gives rise to wider opportunities for student experiential learning with extra-curricular experiences alongside entrepreneurial and enterprise skills development [Gibb, 2013].

Nonetheless, the ITMO case study suggests a new direction towards *socially-oriented entrepreneurial education* marked by a greater emphasis upon student ownership of learning and engagement in assessment processes; where efforts are being made to engage the

² See Interfax on Russian Universities: http://www.univer-rating.ru/rating_common.asp

local community and other 'social' stakeholders in the processes of curriculum design, delivery and student competitions. The ITMO case study illustrates a move from Mode 1 forms of learning, where the university is configured as a space for discovery and learning, to a Mode 2 type of organization with high levels of engagement in learning and knowledge exchange with a wide range of stakeholders.

ITMO's example of *socially-oriented entrepreneurial education* fits with Gibb's [2013] Mode 2 description of an organization with high levels of engagement in learning and knowledge exchange with a wide range of stakeholders. It led to a strengthening of the university's capacity for knowledge exchange and stimulated closer partnerships between students and external stakeholders, with more focus on social needs, learning from practice and the discovery of new ways of expressing, extracting and distributing knowledge.

In the Mode 2 model, knowledge development and production becomes more contextualized to different situations, more problem/issue centered and more reflective of use in practice. This demands more trans-disciplinary approaches which, in ITMO's case, has led to the creation of new interdisciplinary concepts and paradigms, notably, for example, in the introduction of the Life Navigation program.³

In a rapidly changing world the mission of ITMO University as a socially responsible institution focused on the development of the individual acquires a particular urgency [Kivinen et al., 2016]. The education of graduates capable of solving the complex problems of today's society necessarily has to include a practical component. ITMO University has implemented a methodological approach based on the inclusion of projects to provide students with practical experience. Such an approach follows Dewey's pedagogic model [Tomina, 2011], which has also been adopted, and shown to be effective, in influencing the educational system in a number of countries [Rogacheva, 2016].

One major criticism of Dewey's work concerns his overly narrow focus on acquiring experience. A worthy practical project involves undertaking actual and useful tasks in the locality. Practical projects in the curriculum need to include a series of everyday material tasks in order to be measured for assessment purposes. However, an overly strong concentration on practice alone does always allow the student the opportunity to relate the experience of the project to his or her coursework or to acquire a broader understanding of project management and its systematic role in problem-solving beyond the narrow confines of the task in hand. In the ITMO University case study there has been an attempt to unify these two approaches. First year students undertake the "Life Navigation" program in order to develop an understanding of the interconnectedness of such diverse social projects and how they can more broadly impact on society as a

³ See in more detail below.

whole. The second year involves a competition between different social projects, called “People need you!”, in which practical problems are solved by students using a service learning approach. In this, the emphasis is on them understanding the clearly defined link between the skills acquired through their social and community project activities and the development of a more generalizable socially-oriented entrepreneurial approach to life, including a passion for changing things for the better.

3. Entrepreneurship Education at ITMO University

According to GUESSS⁴, entrepreneurship courses were not available to 60% of Russian university students not specializing in Economics, or related subjects like Business Studies, in 2014. Moreover, at the same time, Russian students were ready to commit up to 30% of their time to entrepreneurship courses (which is 5% higher than in comparable surveys of the HE sector outside Russia).

ITMO University has adopted the Glukhikh [2014] framework for entrepreneurial education, in which he asserts that in the process of entrepreneurship education “knowledge and competences are learned and applied much more efficiently if they are taught in a systematic, logical sequence”. He proposes three phases for realization of the entrepreneurial potential:

- 1) *Conception Phase*. This includes how a person’s activities can be adapted to reinforce his/her entrepreneurial capabilities, including the presence of his/her inner reflection on the social aspects and stimulating the readiness of the individual to become enterprising and create the necessary conditions and resources;
- 2) *Formation Phase*, which consists of two sub-phases:
 - a) *Preparation sub-phase*. This starts after a person has taken the decision to start a business and includes information gathering and preparatory work;
 - b) *Creation Phase*, which starts at the registration of the individual’s business and continues for three years (according to Russian law) or until business closure;
- 3) *Development Phase*, which represents business activity after the first three years.

It is the University’s view that the knowledge component of entrepreneurial education, that is, teaching ‘about’ entrepreneurship, rather than teaching ‘for’ entrepreneurship, does not, by itself, lead to entrepreneurial thinking, it is the combination of both theory and practice that optimizes the process. A critical success factor, however, is

⁴ Global Universities Entrepreneurial Spirit Students’ Survey (Russia, 2013–2014, pp. 1–52, published online, August 2014) <http://www.guesssurvey.org/>

the support from the top: the Rector, Vladimir Vasilyev, has committed the university to developing entrepreneurial thinking in its students appropriate to the requirements of the modern knowledge economy [Vasilyev, Sukhorukova, 2014], referring in particular to: *taking the initiative, demonstrating creativity and accepting responsibility*—capabilities which, teaching staff believe, can be systematically nurtured in university.

There are other essential success factors: firstly, practice-oriented education is reliant on students' high motivation and, secondly, on the skill of the teaching faculty in delivering an enterprise-embedded curriculum. Thirdly, there are environmental variables: students can additionally absorb entrepreneurial characteristics if submerged in a university like ITMO where there is a pervasive culture of entrepreneurship following the four-phase Glukhikh [2014] model.

The conception phase at ITMO University is based on the selection of projects which can be systematically integrated within Bachelor's and Master's degree courses and which are aimed at the development of students' universal core competences (including 'soft skills'). Co- and extra-curricular programs may be included at the heart of the system, e. g.

3.1. Bachelor's Degree Level

First Year. Life Navigation course. This course was validated by the Faculty of Technology Management and Innovation in the autumn semester, 2015. Nine groups of first year students accomplished this course.

Second Year. Project Management course (including voluntary participation for all interested students in a social or community enterprise project competition called "*People Need You!*")

Third Year. Entrepreneurship Fundamentals Course. Its aim is the implementation of commercialization of projects spun out of ITMO University's scientific laboratories and research groups. It incorporates a student competition, 'Commercialization of Innovations', within the framework of this course.

Fourth Year. The Bachelor's degree Finals examination became a tool for the practical assessment of the commercialization activity from the spun-out research, or projects, undertaken on courses a year earlier. Following a selection process, the most viable projects were accepted onto a full-scale acceleration program based in ITMO University's business incubators, called SUMIT and Future Technologies business accelerators.

The step-change in the University's thinking, which led to this change in curriculum development, came out of the belief that instigating innovation in society and the economy was, in essence, a people-issue, not a technology-related issue. The real challenge in developing innovation in the knowledge economy was changing people's motivation, transforming the culture: i. e. making people more adaptable and flexible, ready to 'think change', accept it and then implement it.

The underlying academic strategy was to ensure students on ITMO University's Bachelor's and Master's degrees acquired a range of entrepreneurial competences, thus enhancing their chances for future employability. This was set out in three principles of the University's declared mission:

- *person-centeredness*, which is the focus of the first year's Life Navigation course,
- *social responsibility*, achieved through social and community enterprise projects and in the framework of the second year social enterprise competition, "People Need You!",
- *entrepreneurship*, achieved in Years 1 and 2 through the values and competences taught and developed from the commercialization projects, as well as from the third and fourth years of their degree and, later on, from Master's degree study.

4. Introducing Community Project Management into the Education Process

According to Etzkowitz [2013], the "fourth helix element"—the civic society—is a critical stimulus to innovation, by which innovations can often appear in response to social requests, or "societal challenges". The success of innovations coming to market depends on the interaction of the three other triple helix elements—*government, Higher Education, business*—[Etzkowitz, 2008] often in response to the fourth.

If this can be extrapolated to the formation of business strategies, the one driver which is often overlooked is a company's social, or more broadly, its ethical strategy. This element has come to the fore with examples of investors choosing whether to invest or not on the basis of the social, ethical, or community strategy of the target investment company. Certain investors prefer only 'green' investments or 'ethical' investments, including those approved by certain religions or faiths over others. For many students today, the ethical dimension of a business, whether profit-making or not-for-profit, is an essential discriminating component of a company's strategy. A good example here is the TOMS Shoes success in the American shoe market.⁵

What does this increasingly-evident behavioural tendency imply for training or developing individuals in innovation, creativity and entrepreneurship? In its role as a leading technology university, ITMO University has adopted the mission of educating students to become future managers of innovation and technology entrepreneurs, but this aim has now been refined with reference to the social or community context of a future venture.

The implication of this means fostering students' awareness of the social or community dimension of their future business, or employment, and of the social value of the product or service. This means

⁵ See details at: <http://www.toms-russia.ru/about.html>

nurturing his/her entrepreneurial competence within the context of the social or community values—the society where he/she lives—and developing their perception of his/her civic awareness and social responsibility.

In the ITMO learning model, entrepreneurial education is deliberately and systematically embedded into project activity and set within the local social or community context. A revised learning methodology is employed in developing the new-style entrepreneurial student, which is termed *service learning*. This method is based on combining the teaching of project management and entrepreneurship competences within a community-focused environment with a social purpose. *Service learning* is a powerful means of nurturing socially-aware people. It teaches students team-working, tolerance, active participation in improving the local environment and applying these competences in practice. Initially, this awareness is delivered through the Life Navigation course.

5. Life Navigation and Social/Community Project Management

The Life Navigation course at ITMO University focuses on a student's personal development and helps create his/her plans and dreams (see Annex). The University's research shows that students who from the first year link their learning goals to their life goals achieve these goals much faster and easier than those who do not do this. A constructed image of a preferred ideal future helps students make effective choices and facilitates personal and professional development. The Life Navigation course raises the student's self-awareness, which, in the experience of the University, is the starting-point for an individual to reach their own personal entrepreneurial potential.

The University started teaching 'Life Navigation' in parallel to entrepreneurship in 2015 in order to initiate a stage of self-reflection, including personal exploration and development of students' innate entrepreneurial capabilities, leading to improved self-evaluation, social and psychological preparation, with an analysis of external conditions and resources.

The model is a practice-oriented course aimed at teaching students to set their own goals and priorities, determine necessary resources, create self-development programs and match content to goals. The aims and content of the ITMO Life Navigation program draw on the work of two different schools of modern psychology—'Positive Psychology' and 'the Subject-Genetic Approach' [Ognev, Gonchar, 2013].

Positive Psychology focuses on developing a positive attitude towards problem-solving (Seligman, 2006), including the study of positive feelings, revealing positive aspects of the personality, intellect and physical development, and recognizing the positive features of society's institutions of society (such as democracy and family) to enhance the development of the best human qualities. The second school—

Subject-Genetic Approach—asserts that a person needs to take responsibility for his/her personal actions, results, successes and losses.

The original Life Navigation course was conceived by Ognev & Gonchar [2013] at the Sholokhov Moscow State University solely for the Humanities but has been adapted for technology faculties at ITMO University. There are similar examples of curriculum innovation in a range of top universities. Most are designed to equip students with 'life skills' and have a range of emotive titles: 'Wisdom curriculum' (Sternberg, Yale University), 'Going for the goal', Penn Resiliency Program (Seligman, University of Pennsylvania), 'Personal synthesis program' (Great Britain) and 'Happiness' (Tal Ben-Shahar, Harvard University); 'The Art and Science of Happiness' (Dr. Holly Sweet, MIT; e. g. <http://ocw.mit.edu/courses/experimental-study-group/es-s60-the-art-and-science-of-happiness-spring-2013/>).

5.1. Review of the Impact of the Life Navigation Course

The creation and inclusion of this course was prompted by external stakeholders. Feedback from local employers confirms the importance of adding this course for students. According to one employer, Irina Muraviova, Staff Director of the Netrika Company, students fail to find employment for a number of reasons:

- The first failing noted by employers is students' inability to formulate what they really want, i. e. they do not have even a rough life-plan. In this situation, the employer is at a loss to understand what the individual's life goal might be.
- The second is a lack of awareness of their own abilities and inabilities. Essentially, the implication is that the student has little knowledge of what he/she lacks in his/her professional life. She/he cannot make progress without self-knowledge. Muraviova proposes that students should read the CVs of successful job applicants and compare their own.

This justifies the addition of a special seminar on designing an effective CV as part of the Life Navigation Course. The third most frequent discovery is that a student's lack of time-planning skills is a major failing. The employer feedback was then incorporated into the course, *Life Navigation*.

5.2. Results from the Life Navigation course 2015

More than 120 first year students of the Faculties of 'Technology Management & Innovation' (FTMI) and 'Natural Sciences' completed this course in the Autumn Semester 2015. Students' feedback questionnaires showed that the course helped to visualize their dreams, set concrete goals, determine the necessary resources for their achievement, create action plans and self-development programs, find companions and 'start to act'.

A total of 77% of the students responded that the Life Navigation course had helped them to understand themselves better, deter-

mine how to progress and had helped them not only in personal matters, but also in learning other subjects. An example of the impact of the course is based on a series of practical exercises ('Course activities'), one of which demonstrates how students' attitude toward their life plans has changed during their first academic semester.

Case Study of Course Activity. In this particular exercise students make a 2–3 minute video in which they present their life plans especially with reference to the dimensions of family, work, study, finances, hobby, etc. Each student has to set priorities, choose challenges and set him or herself the targets they expect to achieve in them. Russian psychologists relate such descriptions of life aspirations to the category of dreams, which they define as people's ability to model their future and themselves in it (Dodonov, 1978). To outline a route to their dream is the task of the following stages of the course.

Students formulated their career goals as follows: "to find work that gives you pleasure", "to work in a profession I have gained", "after university graduation, to find my place in the world". The topics of family, health and financial well-being also turn out to be important. Students remarked that they would like to "create their own family and also support their parents", "do sports and care for my health", "keep up my hobby, maintain a healthy lifestyle and keep my body in shape".

Four months later, at the end of the course, the students were told again to remake the video about their life plans. In this video, the most significant changes were as follows: in their responses taking the course was perceived by the vast majority (86%) as helping students achieve the first stage in the realization of their life-plans. One student stated: "I was setting priorities and I noticed that in order to achieve my goals I need to complete the university well, so I had to assign top priority to the study".

After a four-month period, the students not only indicated what they would like to achieve, but also set out how they would achieve it: to follow their own pursuits, to network with important people, to plan their time effectively. This marked a change of formulation from "I would like" to "I'm going to achieve this, and I have done ... for this (purpose)", showing an essential change of students' attitude toward their own life plans; moving from stargazing to visualizing dream-goals.

Both videos were analyzed to find out other changes were occurring in students during their first semester. Most students start the second video with the words: "Nothing has changed for me globally, but...". This reflects the tendency of young people to expect some radical changes from their first year at university, which is characteristic of the "generation Z" who are now entering universities.

Following the "but", students began describing their particular discoveries and changes in their life, quotations from their feedback include: "I started to write down my plans", "a solution can always be found", and "we need learn from our mistakes", "the great is built out of a tiny start", so "we need to learn to control our lives", "I recognized

that nothing may be postponed until the last minute”, “I have learned to express my thoughts”, and now “I’m planning every day”, “we need to do everything on time and postpone nothing till the last moment”, “the main thing is to analyze myself and my own activities”.

Teaching staff noted that students’ plans became more structured and concrete. They have conceived which plans are needed to achieve their goals; their obstacles were analyzed within the course to help them to coordinate their activities in order to meet deadlines for the planned objectives.

6. Involving Students in Social Enterprise and Project Planning

6.1. The Competition ‘People Need You’

This competition is designed to combine elements of pedagogical, educational, and innovative learning activities in order to deliver a social enterprise project. The competition consists of four stages.

At the first stage, students apply for participation, design project proposals and arrange interaction with non-governmental organizations (NGOs) which provide facilities for project implementation.

The second stage includes a series of training seminars and master-classes in the field of project activities and social enterprise planning organized with representatives of non-profit-making organizations and universities in St. Petersburg and other Russian cities participating in the network program “University and Society” (<http://socialprojectspb.ru>). The third stage involves the practical realisation of the social projects in cooperation with the relevant NGO. The length of this stage is typically from 3 to 5 months depending on the content of the project. The fourth stage involves report preparation and pitching to the jury board.

The story of the competition “People need you!” illustrates how quickly the socially oriented activities have been developing during the recent year first in a particular University, then in the city of St. Petersburg and then in the country and internationally.

Only 60 students took part in the St Petersburg universities’ first competition in 2013 and only 18 community projects were implemented. The organization of the competition resulted in a little growth in the number of students’ projects in St. Petersburg by 2014: 200 students from 10 HEIs participated in the competition, implementing 48 projects. A series of training seminars was carried out as part of the competition to address project management and social enterprise projects, after which all participants received individual advice from relevant experts.

In 2015, the inter-university competition “People Need You!” was conducted in cooperation with a prominent international university partner—the University of California, Los Angeles (UCLA), USA. This involved exchanging experience in the field of social enterprise, project planning and entrepreneurship. The purpose was to review international best practice in the field of social entrepreneurship and to develop universal entrepreneurial competencies (“soft skills”) in students

from different countries. In June 2015, a decision was taken to conduct the first *International Festival of Social Entrepreneurship* (IFSE) in St. Petersburg. The festival was conducted in association with two partner universities—UCLA and Zhejiang National University, China, in the form of a short-term acceleration program for students of the partner universities. During the project, the contestants implemented their projects in China, USA and Russia using a common general approach and methodology. Later on, in June 2015, they participated in a face-to-face acceleration program in St. Petersburg where, on the basis of their projects, they developed business-plans, financial forecasts and presentations on the further commercialization of their projects.

In 2016 the Competition “People need you!” grew into a nationwide project involving 81 HEIs from 48 cities and 37 regions of Russia; 256 socially-oriented (or simply ‘social’) projects were implemented by participating students and the general network of University-based socially oriented project management was created. By the end of 2016, the second international Festival of Social Entrepreneurship had been held in ITMO university and teams from India and Switzerland were added to the Russian-American-Chinese triangle.

The question then arises about how the greater participation of students in socially-oriented projects should be interpreted. At present there is little evidence to suggest a rising level of interest from students in socially-oriented projects as a matter of principle. On the other hand, there is a *prima facie* case of Russian students’ growing interest in social projects as instruments for developing their own life skills and competencies and for designing future career pathways. In other words, the rising interest in undertaking social projects can be reduced to two factors:

1. The awareness that they can bring real change by their own actions;
2. The wish to have their achievements recognized by external reference (e. g. the University assessors as well as social stakeholders).

Social projects often provide an opportunity because they can be short-lived and can bring quick and tangible results. This dual motivation is more powerful: the change is tangible and the reward of external recognition is rapid. The reward does not have to be material recognition, it can equally be non-material or symbolic; e. g. public praise or expressions of respect from members of the local community. Not only do social and community projects serve as very fruitful ground for developing practical competencies in students who employ their energy and motivation in a productive and structured manner. Social projects help them to realize themselves, receive emotional satisfaction and develop their own significance within society.

This leads to a latent demand for social projects among students, which needs to be formulated, guided and placed into a clear institu-

tional and assessable format. The experience of implementing this at ITMO University by the completion of the “People need you!” program has proven to be positive. This successful outcome was further borne out by data from the Vladimir Potanin Foundation, which sponsors student’s social projects⁶, which identifies how students use social projects as the basis for their career development, especially through social networking, which underlines the educational value of including these in the curriculum.

7. The Evolution of the Three-stage Cycle of Entrepreneurial Education at ITMO University

The GUESSS national report states: “the HEI can become a center for the creation and application of knowledge for regional socio-economic development and educate students not only as professionals in their fields, but also as entrepreneurs creating innovations in the workplace”.⁷

The development of a system of entrepreneurship education shall become one of the priority directions. This system shall be able to nurture the entrepreneurial intentions of students and provide them with various educational services plus institutional and resource support. This requires consideration of the necessity to modernize existing education systems to take into account contemporary trends and to create infrastructure facilitating not only the introduction of entrepreneurship courses, but also initiation of support projects for students’ entrepreneurial intentions. In other words, it is a necessity to implement full-scale changes and formation of a new educational trajectory is a challenge of today.

Modern higher education in Russia has entered a period of radical transformation characterized by the fact that a graduate’s success in the labor market depends now not only on his/her professional knowledge and capabilities, but also on his/her motivation, creativity, and adaptability.

These qualities have always been useful for graduates, but under the conditions of the information society, they become critical. The higher technical education shall be oriented not only towards the creation of professional competences, but also to the formation of social skills necessary for a young specialist entering social and economic life. It shall not only prepare students for professional activity with utilization of modern technologies, but also promote them to a new cultural level corresponding to these technologies.

On the basis of this understanding, ITMO University has formed a general cycle of socio-entrepreneurial education consisting of the following sequence of stages:

⁶ See 2016 Yearly Report of the Vladimir Potanin Foundation <http://www.fond-potanin.ru/media/2017/05/24/1269025795>

⁷ Global Universities Entrepreneurial Spirit Students’ Survey (Russia, 2013–2014, pp. 1–52, published online, August 2014) <http://www.guesssurvey.org/>

Stage 1. In the framework of the general block of social science and humanity disciplines (1–2 years), students acquire knowledge, skills and habits of organizational and managerial activities to develop practical competences for effective future project activity and further professional activity (“soft skills”). In the process of learning these disciplines or during his/her extra-curricular work a student (or a team) may conceive an idea (a project idea).

Stage 2. Students who have a project idea participate in different student contests, for example, the “People Need You!” contest described above. Through realization of their projects in the framework of contests, students consolidate their acquired competences. The projects are registered in portfolios for subsequent obtainment of the practical experience certificate.

Stage 3. Students’ projects undergo expert review in regard to commercialization prospects. The most successful projects go into the business incubator of ITMO University and/or a startup acceleration program which make projects into startups aimed at a market launch of the project’s products or service.

In this way, generation and development of social enterprise projects in the university becomes a continuous sustainable process, leading to:

- education of students’ minds, their social awareness, and character;
- societal and social benefits;
- improvement of the project-to-innovation cycle at the university;
- regular transformation of students’ projects into startups and small innovative enterprises.

8. Conclusion The case study of ITMO University illustrates how student voluntarism is being more widely adopted together with a social enterprise orientation. This is somewhat unusual in the context of Russia, a country which is known for its stronger emphasis on a more directive curriculum, ministerial interventions and the fixed requirements of technology-dominated curricula. The often latent demand from students to engage with, and thereby add greater value to, their society and local community is recognized in many international universities as a driver for change. Sir Peter Downes, Vice-Chancellor of Dundee University, a highly-ranked UK university, argues that the answer to producing more entrepreneurial graduates will not come solely or mainly from formal approaches to teaching, but it will come instead from the example of a university that is fully engaged with the economic, social and cultural needs of society [Downes, 2013].

To be effective, entrepreneurship education needs to generate a high level of student motivation. Motivation often increases when there is a personal identification with the social or community aims of social and community projects. The Life Navigation course described in the Case Study helped to stimulate motivation and provided the tools necessary for the achievement of students' goals.

In this regard, the Life Navigation course was an important step towards the development of *socially-oriented entrepreneurial thinking*—for example, it taught students to pose questions and seek structured answers from which they could formulate their own life plans in the context of their local community and society.

This course is only one step in the development of comprehensive entrepreneurial education in ITMO University. But it is an essential one. The evidence suggests that the student turns into an active, motivated person with the effective tools for self-analysis, able to evaluate their environment in the context of his/her tasks and goals. The earlier a student forms such an analytical matrix in his/her mind and learns to use it during problem-solving, the earlier he/she is ready for practical entrepreneurship and prepared to join the labor market.

ITMO University's experience demonstrates the presence of a high latent demand for project-management skills and the competence to undertake projects and ventures within a social and/or local community context. This in turn creates an ongoing demand from students for such skills thus enhancing and embedding a socio-entrepreneurial culture and spirit across the University, in turn producing a self-generating interest in following this pathway from incoming students.

The Life Navigation course complements entrepreneurship education. It cannot by itself achieve the same results and needs to be combined. The model is transferrable to other HEIs. The form of the social enterprise competition "*People Need You!*", for example, has also been piloted at the federal level in HEIs and supported by the Ministry of Education and Science. The next stage, which is already in progress, is to organize a similar competition in Russian secondary schools and take the concepts into a younger stage of thinking.

The ITMO experience in the Russian context demonstrates the link between a course of study and the development of students' own personal and social values when focused on the broader areas of society's needs. The 'Life Navigation' course taken together with the "*People need you!*" competition constitute a program concerned with developing the individual's capacity to embrace a combination of experience/knowledge and deeper understanding of a world of uncertainty and complexity within a context of social awareness.

Annex.
Life Navigation
Course Content

The course consists of ten modules:

1. “Life aspirations concentrated in a dream”: setting life’s overall purpose.
2. “A tree of life goals”: a decision-tree of mid-term and short-term goals.
3. “Resources”: how to acquire resources necessary to achieve the ends; managing external resources (money and time) and understanding one’s own abilities (and weaknesses).
4. “Interrelationship between personal qualities with competences”: finding opportunities in everyday university life for one’s professional growth.
5. “Self-development program”: drawing up an action plan to attain one’s goals (milestone targets etc).
6. “Overcoming obstacles”: ways of overcoming barriers and finding alternative routes to the goal.
7. “Ideal Me”: self-analysis and overcoming inner failings and how to undergo inward transformation.
8. “Companion map”: essential contacts to make. Developing one’s network.
9. “Everyday regular activities”: employing time management methods and developing effective habits.
10. “Self-motivation”: overcoming one’s inner personality failings.

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Modeling a Foreign-Language Environment When Teaching Non-Linguistic Students: Preliminary Results

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Abstract

A multi-year empirical study (2008–2017) tests a new model of teaching English to non-linguistic students in bilingual classrooms, typical of local colleges in Russia. This model comes in response to the academic community's dissatisfaction with the outcomes of such education. The article consists of two parts. The first provides a brief analysis of cooperating extra-linguistic factors that exert a multidirectional influence on the English learning process of adults in small study groups in the classroom, provided that they are taught by a non-native speaker using standard teaching techniques. The second part of the article describes a foreign-language environment within the unified learning environment of a non-linguistic college. The model developers sought not only to reduce the negative effects of external environment and increase the positive ones but also to encourage non-linguistic students to learn English through academic and professional discourse socialization in the foreign-language environment. Principles of constructing a unified foreign-language environment model and providing an integrated English proficiency assessment system are suggested. Preliminary model testing results are analyzed, and the key advantages of this teaching model, which allow for enhancing not only the motivation of non-linguistic students for learning English but also their levels of proficiency, are identified.

Keywords

teaching a foreign language in college, unified foreign-language environment model, unified proficiency assessment model, classroom bilingualism, non-native English-speaking teacher.

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Russian Youth in the Education System: From Stage to Stage

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Abstract. Official statistics from 1995–2016 are used to describe the dynamics of youth obtaining each subsequent level of education, from middle school to college. The following chronological changes are analyzed with regard to the size of different age cohorts: changes in the number of middle and high school graduates (full-time programs) and their distribution among further educational trajectories; changes in the number of entrants to secondary vocational education, separately for skilled and mid-rank-

ing worker programs, and their distribution between the modes of study as well as among the levels of competencies at the admission stage; changes in the number of entrants to full- and part-time higher education programs and their levels of competencies separately for each of the two modes of study. The Russian Longitudinal Monitoring Survey data is used to analyze the changes of 1995, 2005 and 2015 in the dynamics of the distribution of youth cohorts (ages 20–24 and 25–29) among the levels of education obtained. Academic achievement and mobility between educational trajectories are also discussed.

Keywords: youth, educational trajectories, middle school education, high school education, secondary vocational education, higher education.

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Social behavior of youth in education is largely contingent on the existing structure and institutional peculiarities of the Russian education system, which, in their turn, are defined by the state and dynamics of the economy and society, to the extent that they are subject to external regulation. On the one hand, it is society's needs captured in the education structure that determine the essential ratios of students at different levels of secondary and postsecondary education as well as those of majors, specializations, modes of study, etc. On the other hand, youth as a subject of education actualizes its own interests, attitudes and selectiveness at various stages of their educational trajectories. That is how the needs of youth and its selective behavior in education contribute to the transformation of the education system's structural elements. Besides, these interrelated processes are affected in specific ways by demography, i. e. the constantly changing population of age cohorts, now increasing with every year and then

suddenly falling. This set of factors shapes the ways that young people move from one education level to another through formal institutions of the education system. The major trajectories can be best illustrated through longitudinal analysis of statistical data from the last two decades¹.

**Middle school,
intramural
program**

Middle school education obtained under intramural programs is truly all-encompassing today. The proportion of middle school graduates from the number of first-graders who had enrolled nine years previously was 97.0% in 2000 and 97.9% in 2016, as compared to 81.2% in 1995.

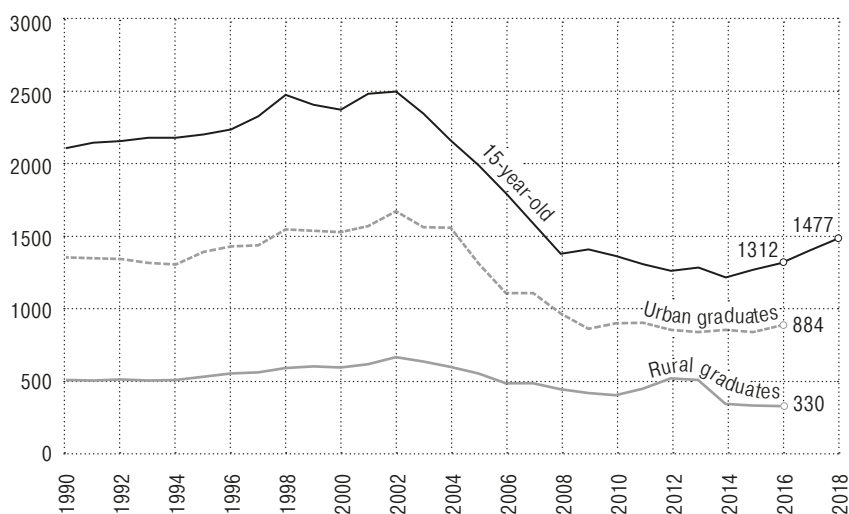
The dynamics of the middle school graduate population (intramural instruction will always be implied here) in both urban and rural localities has mostly been shaped by the demographic factor over the last two decades (Fig. 1): the growth curves for the population of urban and rural middle school graduates are largely consistent with the growth curve for the population of the conventional 15-year-old cohort² (15 years is the mode of the distribution of ninth-graders across age cohorts). As the population of 15-year-olds was growing (by 13.4% from 1995 to 2002), the number of middle school graduates increased faster in rural schools than in the city (by 31.6% as compared to 23.7%), and the subsequent sharp reduction of the 15-year-old cohort (by 44.8% from 2002 to 2008) decreased the number of rural and urban middle school graduates by 33.5% and 42.4%, respectively. As we can see, opportunities for graduating from middle school increased for all young people during this period, more so for rural dwellers than for urban students. The age cohort growth curve then reduces very little in the 2010s, but the year 2016 features an increase in the number of urban middle school graduates (5.5% more than the year before), while rural school indicators for this year are found to be the period's lowest. The previous years' drop in the proportion of youth stepping into responsible life is now ceding to the opposite trend of gradual, long-term growth of the relevant age cohorts. This trend will first manifest itself in the growing population of 15-year-

¹ The majority of the statistics and estimates in this article are based on raw statistical data obtained from the Federal State Statistics Service and the Ministry of Education and Science of Russia: raw statistical data on general education, initial and secondary vocational schools, and higher professional education for 1985–2010, reported by the Federal State Statistics Service to the Department of Sociology of Education of the Institute of Sociology of the Russian Academy of Sciences in 2008–2011; the website of the Ministry of Education and Science of the Russian Federation: [http:// Минобрнауки.рф/министерство/статистика](http://минобрнауки.рф/министерство/статистика).

² Conventional 15-year-old cohort is understood as the number of people born 15 years ago. Mortality rate is usually low at this age and is overall insignificant for the purposes of a longitudinal study.

Figure 1. **The size of the conventional 15-year-old cohort and the population of urban and rural middle school graduates (1,000)**

Additional sources:
[Goskomstat (2001) *Demograficheskiy yezhegodnik Rossii 2001. Stat. sb.* [Demographic Yearbook of Russia 2001. Statistical Book], Moscow: Goskomstat, p. 133; Rosstat (2015) *Demograficheskiy yezhegodnik Rossii 2015. Stat. sb.* [Demographic Yearbook of Russia 2015. Statistical Book], Moscow: Rosstat, p. 37].



olds (Figure 1 expects an increase in the population of middle school graduates in the years to come) and then will affect other levels of education as well (see below).

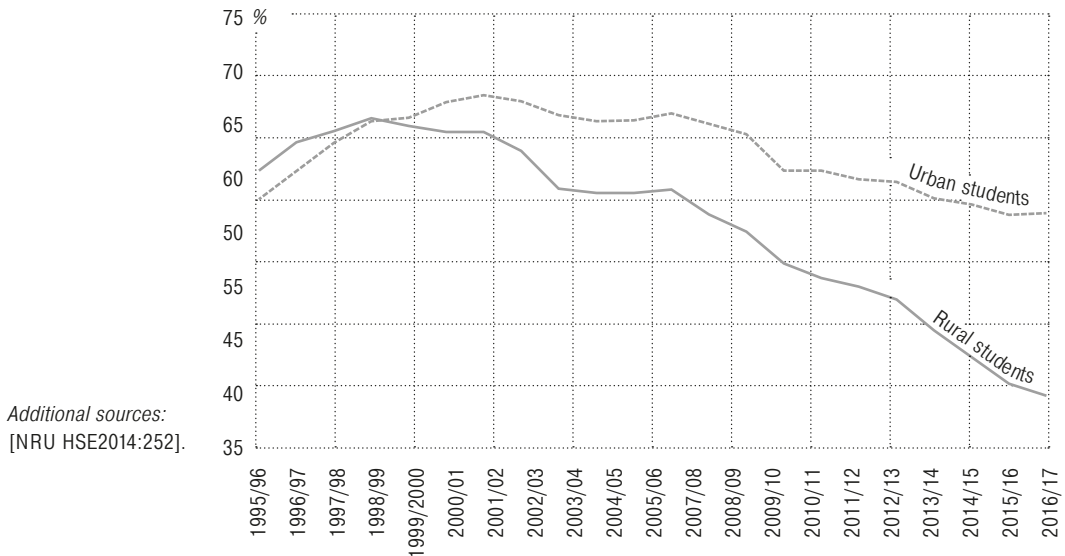
Graduation from middle school is followed by the first fork in youth's educational choices, namely the split into two major educational trajectories: academic (transition to high school; most high school graduates enroll in college) and nonacademic (going to vocational schools³ and learning to be either skilled workers or mid-level specialists). The education system is designed in a way to allow vocational school graduates to continue learning and enhance their level of education.

Rural middle school graduates moved to high school more often than their urban peers up until the 1990s (Fig. 2).

The proportions of middle school graduates proceeding to high school met at the level of 66.3% for both urban and rural schools in the academic year 1998/99, dropping to 59.0% in urban schools

³ Since the Law on Education in the Russian Federation was adopted in December 2012, vocational education has included two stages, which used to be discriminatory. The former system of initial vocational education is now represented in vocational education by skilled worker programs (SWP), while the former system of secondary vocational education is now part of vocational education in the form of mid-level specialist programs (MLSP). The existing terminology will be applied to retrospective data as well in order to avoid confusion in referring to the two levels at different periods. At the same time, previous terms will be sometimes used and explained to describe situations of the past.

Figure 2. **The proportion of middle school graduates proceeding to high school**

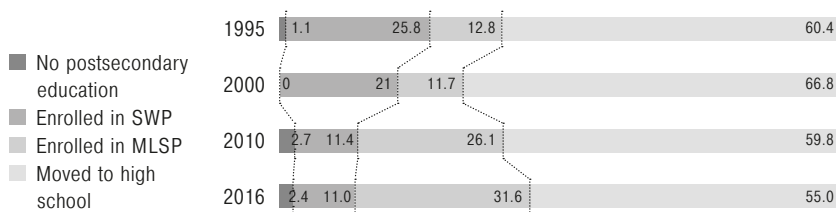


and 44.3% in rural ones by 2016/17. A number of factors induced this change. The reorganization of rural schools, launched in 2001, implied, in particular, reorganizing high schools into middle schools⁴. As a result, rural students became more likely to move on to vocational schools or high schools in nearby cities. The demographic factor also played a role here, as small-sized age cohorts increased middle school graduates' chances of getting admitted to vocational schools. The rate of enrollment (the ratio of the number of students enrolled to the population of 15-year-olds) in vocational education increased from 34.2% in 2000 to 38.6% in 2012 for skilled worker programs and from 35.1% to 50.8% for mid-level specialist programs [NRU HSE2014:23]. Even though these coefficients dropped somewhat due to the reduced enrollment in vocational schools (which are stronger in its skilled worker programs), accessibility of vocational education is still high.

The 1990s saw the following distribution of middle school graduates across educational trajectories (Fig. 3): 60.4% moved to high school, about 25% entered institutions of initial vocational education (MLSP), and 12.8% engaged in secondary vocational education (SWP).

⁴ Resolution of the Government of the Russian Federation No. 871 of December 17, 2001 On the Reorganization of the System of Rural Secondary Schools (as amended on February 1, 2005). Available at: <http://docs.cntd.ru/document/901807007>

Figure 3. **The distribution of middle school graduates across educational trajectories (%)**



As a result of the growing requirements of youth in education, more and more ninth-graders in the second half of the 1990s–early 2000s aspired to go to high school, i. e. opted for the main trajectory towards higher education: 66.8% of middle school graduates moved to the tenth grade in 2000, thus reducing the population of those applying to vocational schools.

The distribution across educational trajectories has been changing since the mid-2000s due to the reduced population of relevant age cohorts. There was a decrease in transition to high school (from 66.8% in 2000 to 59.8% in 2010), while the proportion of middle school graduates choosing MLSP was growing (from 11.7 to 26.1% within the same period). Such a dynamic was partly prompted by the growing popularity of MLSP vocational schools; besides, it was also a product of the considerably reduced enrollment in SWP, which brought down the proportion of middle school graduates applying for this kind of education (from 21% in 2000 to 11.4% in 2010). 2010 saw the continuing growth in the number of students enrolled in mid-level specialist programs and the ever decreasing population of high school students. Even though admission discounts for the transition from vocational MLSP to college were cancelled in 2014, this educational trajectory remains an alternative strategy for subsequent transition to higher education for some of the youth. Mid-level specialist programs are now used to avoid the USE (Unified State Examination). The proportion of middle school graduates moving to high school reduced even further in 2016 (to 55.0%), in contrast to the ever growing population enrolled in MLSP (31.6%). An essential drop in SWP enrollment (see the statistics below) reduced the proportion of middle school graduates opting for this type of vocational education from 25.8% in 1995 to 11.4% in 2016. However, the current proportion of middle school graduates opting for this trajectory remains the same as in 2010, despite the drastic reduction in MLSP enrollment that continued from 2010 to 2016.

The decreasing proportion of middle school graduates moving to high school and the growing percentage of those who opt for mid-level specialist programs in vocational schools are quite an indicative tendency of the 2000s-2010s. It indicates specifically that the trajectory

“through vocational school to university” has become a popular educational and social mobility strategy in the context of social, economic and demographic transformations as well as the Russian education system’s peculiar mechanics. A sociological survey conducted in St. Petersburg and Leningrad Oblast shows that ninth-graders follow risk avoidance strategies when making their educational choices [Aleksandrov, Tenisheva, Savelyeva 2015]. In doing so, they rely on their own perceptions about the benefits, costs and risks implied. Those who consider getting into college through high school and the USE as a risky way choose to retain their family status by enrolling in MLSP instead of adopting the strategy of enhancing the status. A diploma of vocational education adds to the confidence in the labor market and opens up opportunities for engaging in higher education. As Daniil Aleksandrov and his co-authors established, the trajectory “through vocational school to university” is mostly used by social groups between those reproducing the status of a skilled worker and those reproducing the status of a highly-qualified professional. According to the Monitoring of Education Markets and Organizations, on average 31% of MLSP graduates from 2001–2014 enrolled in college the same year they graduated [NRU HSE2016:1].

**High school,
intramural
program**

The population of graduates from intramural high school programs has also been invariably affected by the yearly changes in the size of relevant age cohorts. The conventional cohort of 17-year-olds (17 years is the mode of the distribution of eleventh-graders across age cohorts) increased gradually from 1.848 mln in 1986 to 2.5 mln in 2004 (Fig. 4), followed by a sharp six-year drop to 1.379 mln in 2010. The trough of 1.215 mln observed in 2016 gave way to a slow rise in the cohort of 17-year-olds, potential high school graduates. As early as 2016, the population of urban high school graduates slightly exceeded the rate for the previous year for the first time since 2004 (rural school rates kept going down). Further increase in the number of high school graduates is expected in the years to come, according to the 17-year-old population growth curve.

The ratio of high school graduates to middle school graduates—the so-called “run-up” rate—was growing during the demographic “up-phase” (from 51.2% in 1995 to its maximum of 62.6% in 2002 and 2003) and declining as the cohort reduced (to the lows of 56.1% in 2010 and 51.8% in 2016). At the first stage, it was probably the increasing qualification and professional hiring requirements that prompted students and their parents to invest more in secondary education, which opened up broad access to higher education opportunities. Later on, the “run-up” rate was reduced by the increased popularity of MLSP with middle school graduates and the beginning of the decline in the population of relevant age cohorts, which boosted chances for admission to vocational schools.

Figure 4. The size of the conventional 17-year-old cohort as compared to the population of urban and rural high school graduates (1,000)

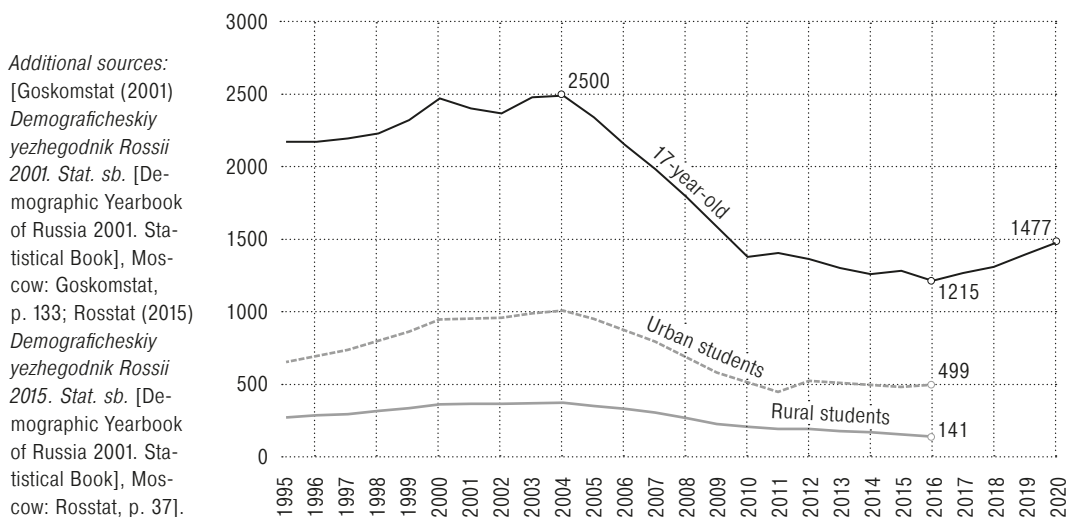
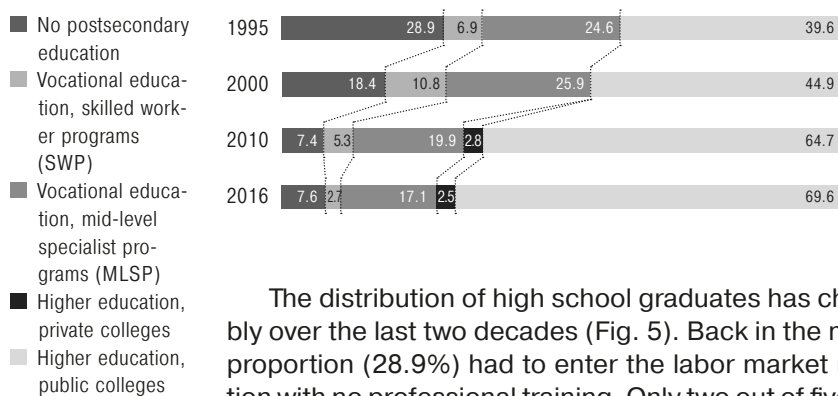


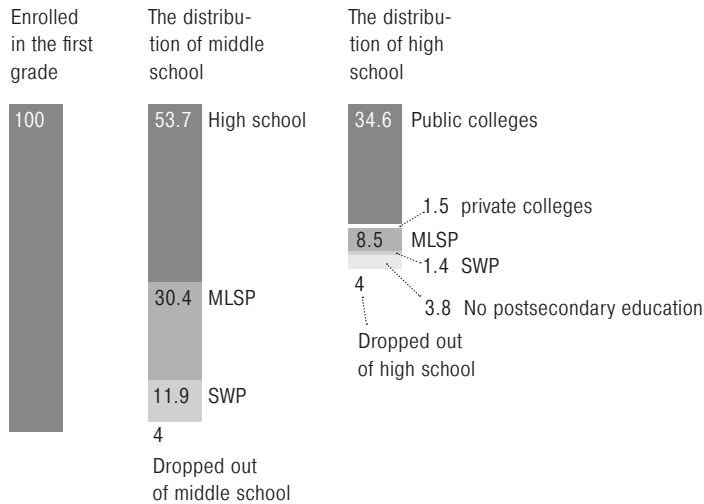
Figure 5. The distribution of high school graduates across educational trajectories (%)



The distribution of high school graduates has changed considerably over the last two decades (Fig. 5). Back in the mid-1990s, a large proportion (28.9%) had to enter the labor market right after graduation with no professional training. Only two out of five graduates made it to college, about 25% went to trade schools (now mid-level specialist programs in vocational education), and 6.9% enrolled in vocational colleges (now skilled worker programs in vocational schools). Youth engagement in various forms of postsecondary education increased significantly as the population of the age cohort was gradually growing and the systems of vocational and, most importantly, higher education, evolved. By 2000, the college enrollment rate had amounted to 44.9% and the proportions of high school graduates choosing SWP and MLSP had slightly increased as well.

During the first decade of the 21st century, the distribution of high school graduates came against the background of the ongoing ex-

Figure 6. **The distribution of students enrolled in the first grade in the academic year 2005/06, across educational trajectories as middle school graduates in 2014 and high school graduates in 2016 (%)**.



pansion of the higher education system and the dramatically (especially in 2004–2010) decreasing population of the age cohort. The number of high school graduates had approached college enrollment rate by 2010: 756,300 as compared to 659,600, respectively. As a result, the proportion of high school graduates enrolled in college increased by 22.6 percent, from 44.9% in 2000 to 67.5% in 2010. It was current-year graduates from high school intramural programs who made up the majority of students enrolled in full-time public college programs (79–81% throughout the 2000s). As compensation for this boost, the proportion of high school graduates enrolled in MLSP and SWP decreased (from 25.9% and 10.8% in 2000 to 19.9% and 5.3% in 2010, respectively) due to the reduced enrollment in skilled worker programs and, since 2004, in mid-level specialist programs as well. In general, most high school graduates of the early 2010s enrolled in college the same year they graduated.

The considerable drop in the population of potential college students was reflected in the education system structure: college enrollment started reducing in 2008 (slightly behind time), a tendency that intensified after 2009. Nonetheless, the trends in the dynamics of distribution of high school graduates shaped in the 2000s persisted for six more years. The proportion of high school graduates enrolled in colleges kept growing until it reached 72.5% in 2016, while the percentage of those opting for vocational schools kept going down for both MLSP (to 17.1%) and SWP (to 2.7%). The proportion of high school graduates outside the system of postsecondary education remained at low levels in the 2010s (7.6% in 2016).

The year 2016 was that of the lowest population of the conventional cohort of 17-year-olds (1.215 mln). Colleges enrolled 531,300 students to full-time programs, while the population of high school graduates was 619,100, hence the ratio was 1:1.17 (as compared to 1:1.15 in 2010). The population of 17-year-olds started creeping upward in 2017, so higher education may start becoming less accessible for high school graduates, provided that enrollment remains the same in full-time-programs and drops in extramural ones (see below).

Figure 6 provides data on the educational choices that the generation enrolled in the first grade in 2005/06 made as middle school graduates in 2014 and as high school graduates in 2016. The figure sheds light on the proportions in which educational trajectories are distributed within a generation. These starting points in education will be developing as a result of using the opportunities offered to youth by different levels and modes of postsecondary education.

Vocational education: skilled worker programs (SWP)

Initial vocational education, now referred to as skilled worker programs in vocational schools, used to be quite an encompassing avenue of vocational education before the 2000s. This educational subsystem has reduced a lot over the last two decades, first as a result of a massive cut in government funding, and recently due to the decreasing age cohort (the number of applicants is diminishing significantly, since smaller cohorts have better chances of getting to college). SWP enrollment rates have quickly decreased over the years: by 11.3% from 1995 to 2003 (from 928,000 to 823,000), by 26.0% in the next seven years (from 823,000 in 2003 to 609,000 in 2010), and by 63.3% in the following six years (from 609,000 in 2010 to 224,000 in 2016). Overall, SWP enrollment decreased 3.8 times between 2000 and 2016. The ratio of the population of SWP students to that of 15–17-year-olds dropped from 22.5% in 2010 to 19.4% in 2013 [NRU HSE2014:300].

Consumers of educational services in skilled worker programs are represented by middle and, more rarely, high school graduates who are enrolled in middle- and high-school-based programs, respectively. Middle school graduates have consistently accounted for the majority of SWP student population (66.4% in 1995; 69.0% in 2010), their percentage having grown to 79.6% by 2016 (Table 1).

Interestingly, the proportion of current-year middle school graduates among students enrolled in middle-school-based programs came down a little (from 61.1% in 1995 to 59.5% in 2016), whereas that of middle school graduates with certificates obtained in previous years increased significantly (from 5.3% to 20.1%), so the ratio between current-year and previous years' middle school graduates is now 3:1 in the population of students enrolled in middle-school-based SWP. The percentage of students enrolling in high-school-based programs has been quite stable: 26.0% in 1995 and 27.8% in 2016. However, it also reveals a reduction in the proportion of current-year graduates (from

Table 1. Levels of education of students enrolled in skilled worker programs of vocational schools (%)

	1995	2005	2010	2016
Total	100	100	100	100
Including:				
Middle school, interrupted	7.7	4.9	6.8	
Middle school, graduation in the current year	61.1	62.8	52.2	59.5
Middle school, graduation in previous years	5.3	8.4	16.8	20.1
High school, graduation in the current year	18.7	18	9.1	7.6
High school, graduation in previous years	7.3	5.8	15.1	11.7
Vocational/higher education	—	—	—	1

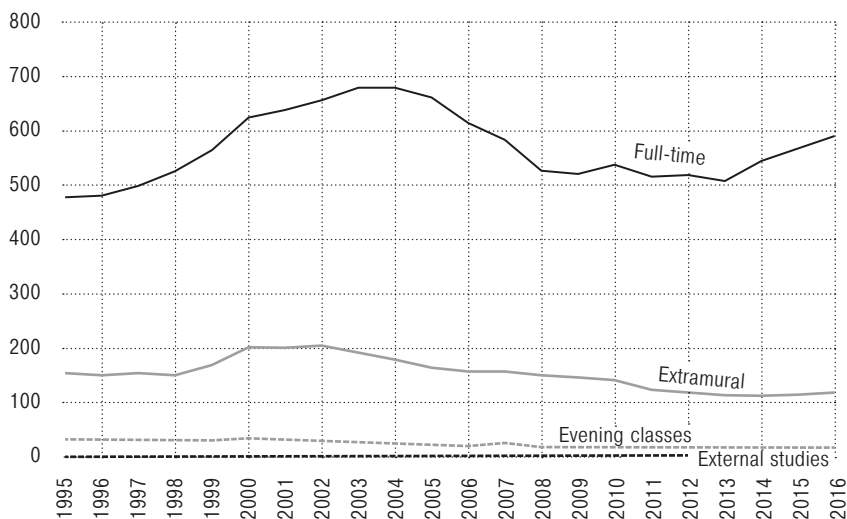
18.7% to 7.6%) and a slight increase in that of previous years' graduates (from 7.3% to 11.7%). Before the system of initial vocational education was reorganized into SWP, vocational colleges had also admitted applicants who dropped out of middle school: 7.7% in 1995 and 6.8% in 2010. Nowadays, this very small group of youth can learn vocational skills by engaging in vocational training.

Vocational education: mid-level specialist programs (MLSP)

Vocational schools offering mid-level specialist programs have always been popular among young people, especially middle-class students. Admissions during the 2000s were most competitive in 2003 with 153 applicants per 100 places, falling to to 131 in 2008. The average number of applicants per 100 places in 2010 was 143.1, with 162.1 applicants per 100 government-funded places. These indicators increased in 2016 to 198.3 and 215.8 respectively. As for middle-school-based programs, the average number of applicants per 100 seats was 201.8 for government-funded places and 152.7 for self-paying students, which is lower than in high-school-based programs-278.6 and 171.9 respectively.

Figure 7 presents the dynamics of MLSP enrollment across the modes of study. Data analysis will be based on annual 17-year-olds' population estimates specified earlier in this article, as the modes of distribution of students enrolled in middle- and high-school-based programs are 16 and 18 years, respectively. Enrollment in full-time programs increased from 477,600 in 1995 to 680,100 in the academic year 2003/04 (by 42.4%), which exceeded the growth in the population of 17-year-olds (by 14.7%). A sharp reduction in the size of the cohort (by 44.8%) in 2004–2010 resulted in MLSP enrollment shrinking as well from 680,100 to 537,900 (by 20.9%). That is, although the chronological fluctuations in the enrollment in full-time mid-level spe-

Figure 7. **Enrollment in mid-level specialist programs of vocational schools across modes of study (1,000).**



Additional sources:
 [NRU HSE2014:320].

cialist programs were affected by demographic change, they indicate an increase in the involvement of 17-year-olds in education of this type. The population of the age cohort kept decreasing in 2010–2016, yet slower than during the previous years (by 11.9%). Meanwhile, enrollment in full-time MLSP, which had remained pretty much the same in 2010–2013, increased by 16.5% over the next three years, from 507,200 to 590,700 (in 2016). Therefore, the involvement of 17-year-olds in this type of vocational education has increased noteworthy over the 2010s, especially over the last three years.

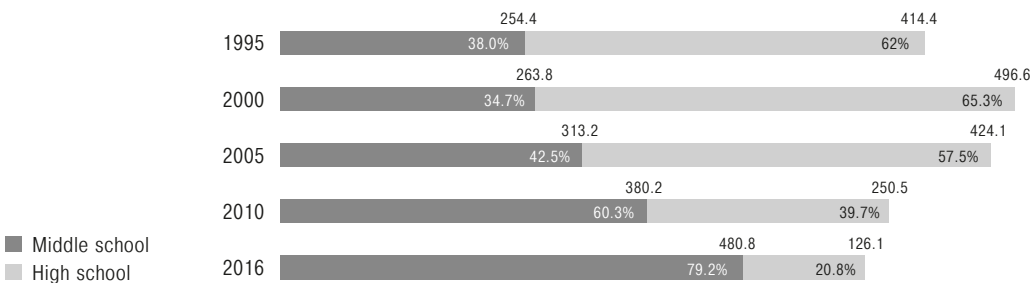
Enrollment in extramural mid-level specialist programs does not depend that much on the size of the 17-year-old cohort, as the distribution of admitted students across age cohorts is much more dispersed here than in full-time programs. Chronological enrollment fluctuations were insignificant: an increase from 154,100 in 1995 to 205,300 in 2002—the highest point in the whole two-decade period—was followed by a slow decline to 141,200 in 2010 and 118,800 in 2016.

The structure of enrollment broken down by the modes of study has been quite stable (Fig. 8), with slight chronological fluctuations not changing the overall ratio between full-time and extramural students as such. Throughout the whole period, the proportion of full-time enrollments was gradually growing (from 71.9% in 1995 to 81.3% in 2016) while that of extramural enrollments was naturally falling (from 23.2% to 16.3%). The normally low percentage of enrollment in evening classes dropped even more, from 4.9% in 1995 to 2.4% in 2016. The growing enrollment rate in full-time programs captures the priority that students give to more comprehensive training, which is

Figure 8. Enrollment in mid-level specialist programs of vocational schools across modes of study (%).



Figure 9. The number and proportions of middle and high school graduates in MLSP enrollment (1,000; %).



also in line with the policy for active involvement of younger labor market entrants in education.

The majority of students enrolled in MLSP—about 90%, with a peak of 95% in 2016—has been represented by middle and high school graduates throughout the two decades. The proportions of students enrolled to middle- and high-school-based programs are indicative of the major MLSP enrollment trends. Figure 9 provides data on the number and proportions of middle and high school graduates in MLSP enrollments. High school graduates, enrolled in relevant programs, constituted the majority up until 2009: 62% in 1995 and 65.3% in 2000 (the period’s highest), as compared to 38% and 34.7% of middle school graduates, respectively. The proportions became virtually equal in 2008, which was followed by an increase in the population of middle school graduates, who accounted for 60.3% of the cumulative population of middle and high school graduates in 2010 and 79.2% in 2016. Mid-level specialist programs in vocational education have shifted from the preferred choice of high school graduates into that of middle school graduates. Such a dynamic is in line with the changes mentioned above, namely the reduced proportion of middle school graduates moving to high school, especially in rural areas (see Figure 2), and the increased proportion of middle school gradu-

Table 2. **Levels of education among students enrolled in MLSP vocational schools (%)**

	1995	2005	2010	2016
Total	100	100	100	100
Including:				
Middle school (intramural program), graduation in the current year	35.6	36.1	48.9	52.7
Middle school, any type of institution, graduation in previous years	2.3	2.5	4.6	13.4
High school (intramural program), graduation in the current year	33.7	37.8	21.3	14.6
High school, any type of institution, graduation in previous years	20.1	14.5	14.2	14.3
Vocational school (SWP)	5.1	7.4	8	3.2
Vocational school (MLSP) / higher education	3.1	1.7	2.5	1.8

ates enrolling in mid-level specialist programs of vocational schools (see Figure 3).

Table 2 presents more detailed information on the educational level of students enrolled in MLSP vocational schools over the last two decades. The proportion of current-year graduates enrolled in middle-school-based programs increased by 17.1% (from 35.6% in 1995 to 52.7% in 2016), and that of previous-years' graduates increased by 11.1% (from 2.3% to 13.4%). In contrast, the proportion of current-year high school graduates in the population of students enrolled in high-school-based programs declined by 19.1% (from 33.7% to 14.6%), as compared to the 5.8% drop in the percentage of previous years' high school graduates (from 20.1% to 14.3%). As we can see, the proportion of middle school graduates was growing faster due to the increase in the number of current-year graduates (from middle school) among applicants, and the proportion of high school graduates was also reducing faster among current-year graduates (from intramural high school programs).

The trends described indicate, coupled with the data provided above (see Figures 3 and 5), that MLSP vocational schools become more and more attractive for current-year middle school graduates and less and less so for fresh high school graduates. Nearly all current-year middle school graduates going to MLSP vocational schools (98.5% in 2016) enroll in full-time education programs.

The population of high school graduates enrolled in MLSP vocational schools (28.9% of total enrollment in 2016) consists today of half fresh high school graduates and half earlier high school graduates. Full-time education programs are pursued by 82.2% current-year graduates, whereas 71.4% of previous years' graduates enroll in extramural programs. Therefore, mid-level specialist programs are becoming less popular among fresh high school graduates, while

middle school graduates entering the labor market turn to MLSP vocational schools feeling the need to learn specialized skills, while most often working full-time. In addition, mid-level specialist programs attract a very small number of graduates from SWP vocational schools (3.2% in 2016) as well as other MLSP vocational schools and colleges (1.8% in 2016).

The growing popularity of MLSP among specific youth categories and the reducing size of the relevant age cohort have increased the involvement of youth in MLSP vocational education over the last decade: the proportion of MLSP students in the total population of 15–19-year-olds increased from 21.9% in 2005 to 25.8% in 2010 and 28.5% in 2013 [NRU HSE2014:31]. The 2016 estimate indicator was 29.2% for those born 15–19 years ago⁵.

Higher education

Colleges are the most attractive trajectory of postsecondary education for youth, particularly graduates from intramural high-school programs. Admission to public colleges was as competitive as about 1.9 applicants per spot throughout 1995–2000, going up to 2.05–2.07 by 2006–2008 and then down to 1.3 in 2010 due to a sharp decrease in the population of the age cohort. Admissions to full-time college programs have always been more competitive, with an increase from 2.1 applicants per spot in 1995 to 2.9 in 2000, followed by a drop to 1.11 in 2010. There is no possibility to compare the dynamics of past years with current indicators, as admission requirements have changed, allowing candidates to apply to more than one college. Therefore, admission competitiveness will be described across different types of colleges and modes of study for the admission year 2016 (Table 3).

The cumulative indicator of college admission competitiveness is 4.7 applications per spot. Meanwhile, admissions to public colleges are much more competitive: 5.1 applicants per spot as compared to only 1.6 in private colleges. This gap becomes even wider as major categories of applicants are compared across the two types of colleges. While 62.6% of enrollment in public colleges (and 55.2% of total college enrollment) is accounted for by full-time programs with their 6.8 applicants per spot (including 9.1 applicants per government-funded spot), 78.4% of students admitted to private colleges (9.3% of total college enrollment) enrol in extramural programs with only 1.3 applications per spot, i. e. access to this type of education is virtually unfettered. Admission to extramural programs in public colleges is low-competitive too: 2.2 applications per spot, this higher education trajectory growing more and more popular among young people and accounting for 30.8% of total college admission. That is,

⁵ Rosstat (2015) *Demograficheskiy yezhegodnik Rossii 2015. Stat. sb.* [Demographic Yearbook of Russia 2015. Statistical Book], Moscow: Rosstat, p. 37].

Table 3. **Competition for admission to college in 2016:
applications per place**

Mode of study	Public colleges	Private colleges
Full-time	6.77	2.76
Evening classes	3.13	1.69
Extramural	2.23	1.26
Total by college type	5.09	1.56
Total:	4.67	

about 40% of college applicants go through low-selective admission these days.

The labor market in Russia wants college-educated employees, so youth's demand for this type of education is growing. College enrollment boosted from 681,000 to 1,640,500 in 1995–2005 due to the growing population of potential applicants: the conventional cohort of 18-year-olds (18 years is the mode of the distribution of college entrants across age cohorts) increased by 116%, and the number of admitted students skyrocketed by 241% (Fig. 10). The years 2005–2011 saw a sharp 44.9% decrease in the population of 18-year-olds.

While enrollment in full-time college programs responded to the demographic change with a gradual decrease, more and more young people enrolled in extramural programs up until 2008. As a result, the total number of students enrolled in colleges reached its maximum of 1,681,600 in 2007.

Total college enrollment reduced by 26.4% between 2005 and 2011. Therefore, it increased faster and decreased slower than the population of 18-year-olds in its respective periods of rise and fall. Involvement of youth in education increased significantly during the period analyzed: the enrollment rate of 17–25-year-olds rose from 23% to 32.3% in 2000–2005 and then, despite the reducing age cohort, to 35.4% in 2010 and 33.7% in 2013 [NRU HSE2014:356].

After 2011, the conventional cohort of 18-year-olds reduced by only 11.8% to its lowest in 2017, followed by growth. Enrollment to full-time college programs became stable (673,400 in 2012 and 674,300 in 2016), while that to extramural programs dropped by 22.6% within the same period. The reason for this is quite obvious: small age cohorts only began to “run up” to extramural education programs during this period, as age distribution is much more dispersed here than in full-time college education. Seventy-two percent of students enrolled in extramural programs are aged 18–26, while 73.1% of those in full-time programs are 18 years old or younger.

The ratio of the population of students enrolled in full-time college programs to the size of the conventional 18-year-old cohort (where

Figure 10. College enrollment across modes of study (1,000)

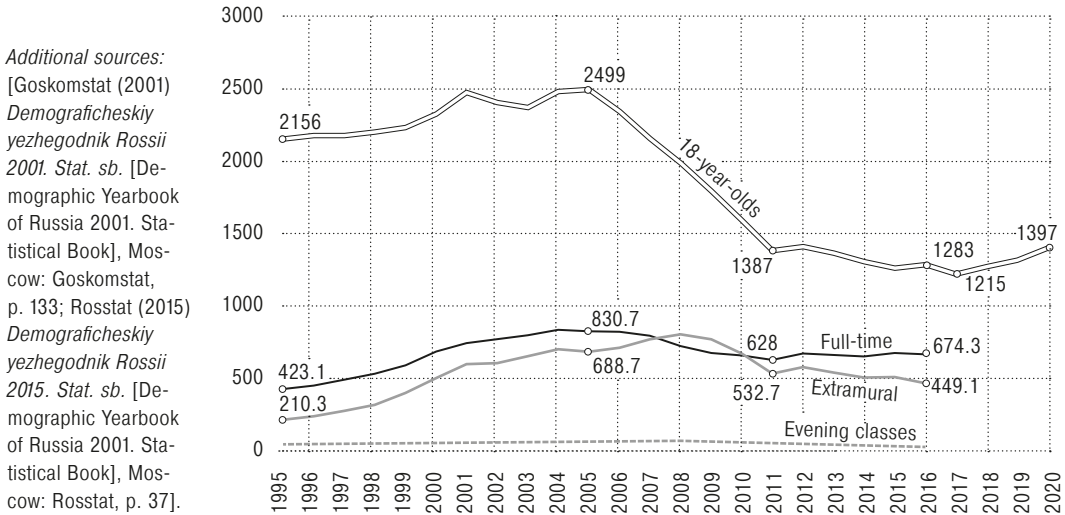


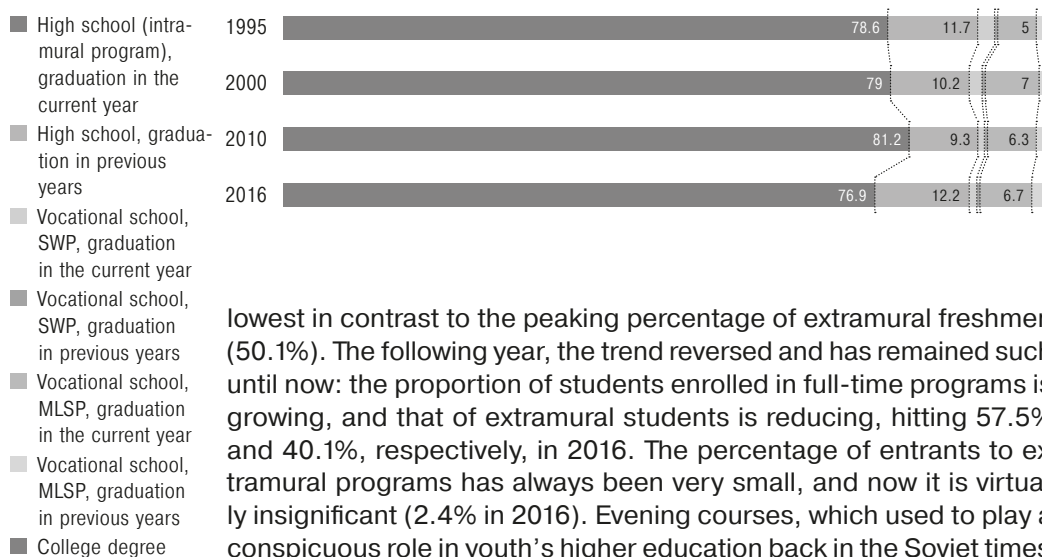
Table 4. College enrollment across modes of study (%)

	Total	Modes of study			
		Full-time	Extramural	Evening courses	External studies
1995	100	62.1	30.9	6.5	0.4
2000	100	53.2	38.9	6.3	1.5
2005	100	50.1	42.0	5.2	2.1
2009	100	43.9	50.1	3.8	2.2
2010	100	47.1	48.0	3.7	1.1
2015	100	55.3	41.7	3.0	
2016	100	57.5	40.1	2.4	

current-year high school graduates account for nearly 80% of enrollment) is estimated to assess the dynamics of youth involvement in higher education. This indicator is not equivalent to the more accurate one mentioned above—the college enrollment rate of 17–25-year-olds—and can only be used indirectly to evaluate the dynamics. This ratio increased from 19.6% in 1995 to 35.4% in 2005, then to 45.6% in 2011 and 52.6% in 2016.

The structure of college enrollment broken down by the modes of study underwent considerable changes throughout the two decades analyzed here (Table 4). Enrollment to full-time programs was on a downward trend, falling from 62.1% in the mid-1990s to 43.9% in 2009, the year when the proportion of full-time enrollments was at its

Figure 11. Levels of education among students enrolled in full-time college programs (%).



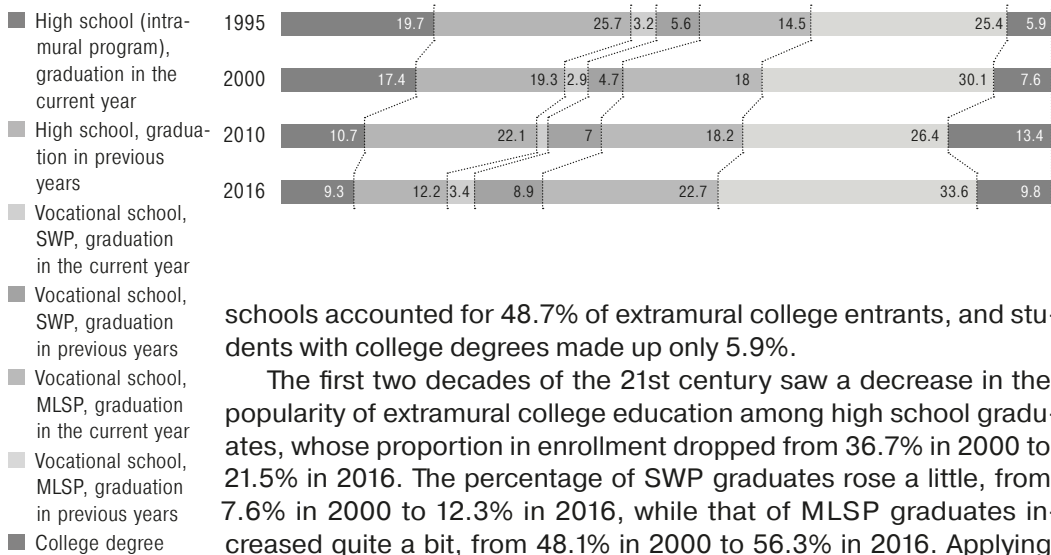
lowest in contrast to the peaking percentage of extramural freshmen (50.1%). The following year, the trend reversed and has remained such until now: the proportion of students enrolled in full-time programs is growing, and that of extramural students is reducing, hitting 57.5% and 40.1%, respectively, in 2016. The percentage of entrants to extramural programs has always been very small, and now it is virtually insignificant (2.4% in 2016). Evening courses, which used to play a conspicuous role in youth's higher education back in the Soviet times, have lost their importance today as full-time college students often engage in freelancing or even get major-related jobs.

Applicants to full-time and extramural programs differ significantly in their level of education at the stage of admission. The distribution of entrants to full-time college programs across levels of formal education has remained the same over the last 20 years, nearly nine out of ten being graduates from intramural high school programs (Fig. 11), i. e. students enrolled in full-time college programs are mostly fresh high school graduates.

The ratio of current-year and earlier graduates among college entrants was the most imbalanced when admissions were the least competitive in 2010–2011 (81.2% to 9.0%). In 2016, it was 76.9%: 12.2%. Other levels of education are very rare to find among students enrolled in full-time college programs, e. g. graduates from SWP vocational schools accounted for as little as 2.7% in 1995 and 1.5% in 2016. A slight increase in the proportion of MLSP graduates is observed in this period: from 2.2% in 1995 to 9.0% in 2016. Therefore, current-year graduates from intramural high school programs are certain to win the competition for places in full-time college programs.

The distribution of youth applying to extramural college programs across levels of education is different from that of full-time program applicants, which is explained by the specific age composition (Fig. 12). This distribution has changed considerably over the period analyzed. Twenty years ago, 45.4% of extramural college entrants were high school graduates, mostly of previous years (25.7%), i. e. those who failed (or never tried) to enter a college the year they graduated from high school. Graduates from SWP and MLSP vocational

Figure 12. Levels of education among students enrolled in extramural college programs (%).



schools accounted for 48.7% of extramural college entrants, and students with college degrees made up only 5.9%.

The first two decades of the 21st century saw a decrease in the popularity of extramural college education among high school graduates, whose proportion in enrollment dropped from 36.7% in 2000 to 21.5% in 2016. The percentage of SWP graduates rose a little, from 7.6% in 2000 to 12.3% in 2016, while that of MLSP graduates increased quite a bit, from 48.1% in 2000 to 56.3% in 2016. Applying to college with a MLSP diploma has thus become an alternative trajectory towards higher education [Aleksandrov, Tenisheva, Savelyeva 2015]. The proportion of fresh MLSP graduates among extramural college entrants is rather high today, accounting for 22.7% of enrollment in 2016. While mid-level specialist diplomas are economically inferior to college degrees in the labor market, they open up the opportunity for professional growth through obtaining higher education while working full time. Employees with MLSP diplomas of previous years also engage actively in extramural college education (33.6% of enrollment in 2016). As we can see, extramural college education is predominantly the strategy pursued today by graduates from MLSP vocational schools, most of whom are employed already.

Obtaining a second college degree is becoming more and more widespread these days. The law only allows for doing so in extramural form. The percentage of college-educated students enrolled in extramural college programs was 7.6% in 2000 and 9.8% in 2016.

The growing popularity of higher education during the period analyzed was largely contingent on the emergence and wide range of tuition-based educational services delivered both by private colleges and under tuition contracts in public educational institutions. Enrollment in private colleges increased from 47,200 in 1993 to 297,600 in 2007 and then declined gradually to 109,300 in 2016. The percentage of students enrolled in private colleges in total college enrollment increased from 8.0% in 1993 to 17.2% in 2008, showing the most rapid growth in extramural enrollments (from 10.0% to 25.6%), which was followed by a drop under the influence of the demographic trough. Students enrolled in private colleges in 2016 accounted for 11.8% of

total college enrollment and 23.1% of all entrants to extramural programs.

Self-paying students enrolled in public colleges accounted for over 40% of total college enrollment in 2000, increasing to 53.4% in 2013 and slightly decreasing to 52.2% in 2016. The proportion of full-time students enrolled in public colleges under tuition contracts is 39.3% (37.5% in Bachelor's degree programs and 45.4% in Specialist's degree programs), while that of extramural self-paying students is as high as 74.6% (in both Bachelor's and Specialist's degree programs).

Levels of youth education

So, what is the outcome of youth generations moving from level to level in the education system? Let us use the Russian Longitudinal Monitoring Survey data (RLMS)⁶ to illustrate the situation. Figure 13 shows the distribution of 20–24-year-olds by confirmed levels of education in 1995, 2005 and 2015. It should be taken into account, however, that education is still pursued by a large proportion of young people at this age, mostly those enrolled in college and to some extent those in MLSP vocational schools. Wave-like distribution curves shift to the right with time, indicating a growing proportion of better-educated people in this cohort. Twenty years ago, almost half the cohort (46.2%) remained at the level of high-school education, those with MLSP diplomas only accounted for 36.4%, one out of ten had a middle-school background only, and college degrees had been obtained by only 7.1%. The ratio of the high-school-educated and those with MLSP diplomas is inverse today: 27.7% to 43.0%. Along with the data provided earlier in this article, this dynamic marks the intermediary role that MLSP vocational schools now play in the mobility between educational trajectories for a substantial proportion of youth. The percentage of college-educated people in the cohort is 2.6 times higher today than 20 years ago (18.7%); the proportion of the middle-school-educated has remained the same, but most of them have also obtained some vocational training.

As for the cohort of 25–29-year-olds, the same data for which is presented in Figure 14, the majority of young people have already completed their formal education at this age. The distribution across levels of education in this cohort provides a much more accurate picture of youth's educational attainment than in the 20–24-year-old cohort. The distribution curve also shifts to the right over time, yet it looks more like a semi-wave, the peak shifting from the median indicators (the level of high school) to the highest ones (college education).

⁶ Russian Longitudinal Monitoring Survey—Higher School of Economics (RLMS-HSE) <http://www.hse.ru/rlms/spss>

Figure 13. Levels of education among 20–24-year-olds, RMLS data (%).

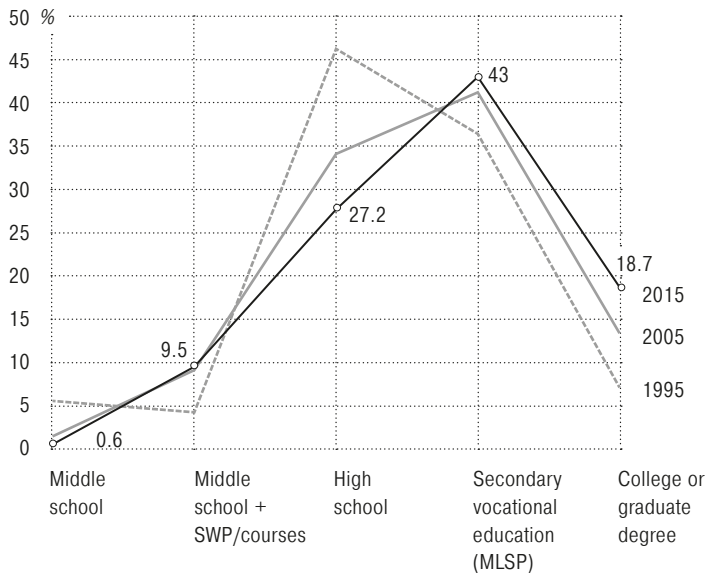
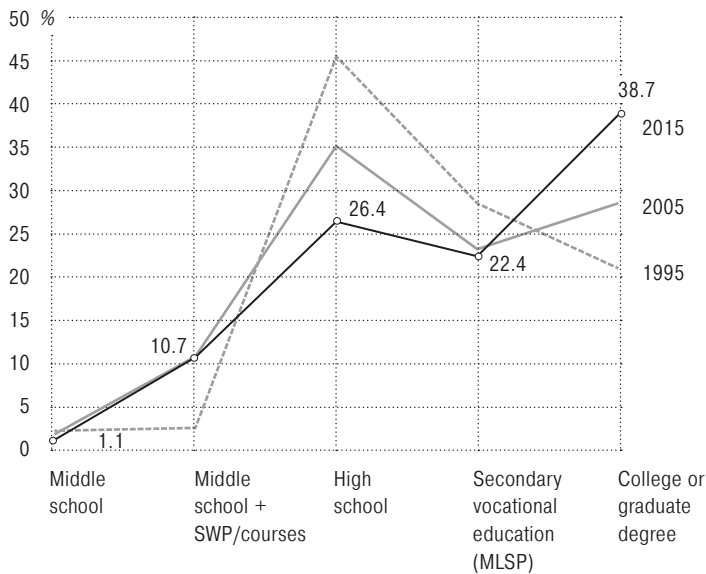


Figure 14. Levels of education among 25–29-year-olds. RMLS data (%).



Today’s 25–29-year-olds outstrip their coevals of 20 years ago in their level of formal education. Middle-school education was the most widespread level back in 1995 (45.5% of youth), whereas college degrees are predominant today (38.7%). The proportion of college-educated people in the cohort correlates positively with the size of popu-

lated locality, being 49.6% in regional capital cities, 34.0% in all other types of cities and 22.4% in rural settlements. People with a high-school background only accounted for a little over 25% in 2015, while over 10% had middle-school diplomas (coupled mostly with vocational training), and 22.4% were graduates from MLSP vocational schools. As we can see, the percentage of the MLSP-educated is almost twice as low among 25–29-year-olds than among those aged 20–24.

Of course, these are two different generations, and this data only marks the downward trend in the proportion of mid-level specialists in the transition from one cohort to the other. Nevertheless, this data is also very indicative of how MLSP vocational education is becoming used more often as a bridge to the system of higher education and how MLSP graduates tend to enroll in extramural college programs.

Conclusion and post-reflection

The trends in youth educational trajectories and the mobility between them in the last two decades reveal a stable expansion of education systems in Russia. Demand for higher education increased the most rapidly before the mid-2000s due to a surge in the youth population. The dramatic reduction in the size of age cohorts stepping into responsible life caused a decrease of absolute enrollment indicators in vocational and higher education systems. Meanwhile, the relative indexes of college accessibility remain very high due to the shrinkage of the age cohort. This is made possible by the Russian education system's institutional characteristics, which allow for not only pursuing the “high school—college” academic trajectory but also accessing higher education through vocational schools thanks to the opportunity for mobility between educational trajectories. In particular, the last decade has seen a growing popularity of the “middle school—trade school—university” trajectory, where MLSP education is obtained on a full-time basis and higher education is either accessed by transition from trade school to a full-time program or, most often, obtained under extramural programs. This trajectory serves as an alternative, safe channel of social mobility for strata with limited (as compared to those following the academic trajectory) resources. It owes its popularity to the combination of low risks (admission without the USE) and benefits in the labor market, which consist in earlier access and guaranteed mid-level specialist status. As a result, about 40% of today's young people obtain college degrees by the age of 30.

On the one hand, the wide spread of higher education satisfies the social and economic need for highly qualified professionals, while on the other hand it entails certain devaluation of college diplomas in the labor market. According to RMLS data, 30–39-year-olds employed in mid-level specialist positions in 2015 included 61.6% of college-educated people, 29.9% of vocational school graduates and 6.8% of those with a high-school background, the rest having inferior levels of education. Among “customer service clerks”, 32.7% had college de-

grees, 25.0% had vocational school diplomas, and 30.8% were high school graduates. College-educated people accounted for 25.7% of sales assistants, 13.4% of skilled manual workers and 15.8% of skilled machine operators. To what extent using highly qualified professionals in such jobs is required by the production process is beyond the scope of this article. It is obvious, however, that a certain proportion of college-educated workers did not succeed in finding a job to match their confirmed level of education, so their diplomas turned out to be subjectively devalued.

Diplomas from higher education remain out of use due to the imperfect mechanism of how labor market needs, consumer demand for education and response from the market for educational services interact under the new conditions. Russia's modern labor market shows a growing demand for knowledge, high qualifications and, in the first place, being capable of and at ease with learning new things and acquiring new skills and competencies. With the boom of the service industry, in its broad sense, came the need for a large number of employees with good soft skills, and college-educated people gained the best part of such jobs as a result of competition. This way, a college diploma has come to indicate the possession of universal competencies and an adequate degree of socialization. According to a survey conducted by the Russian Public Opinion Research Center (VTsIOM) in 2003, nearly half of the companies employing young people with college degrees made use not so much of their domain-specific knowledge as of their social competencies acquired as part of their higher education. Demand for these competencies has been demonstrated by employers who deal with the recent social need for taking social communication to a new level to fit into the urbanized post-industrial society [Levinson 2005:119–120].

This recent demand for knowledge and soft skills together with the labor market's signal of higher economic returns (salary bonus) on college degrees [Gimpelson, Kapelyushnikov 2011:78] spurred youth's demand for higher education, thus inducing mass higher education largely supplied by business entities. This gave rise to the sector of low-quality or sometimes even pseudo-education. Since businesses are focused not so much on labor market needs as on demand from major consumers—college degrees as such or specific majors perceived by consumers as popular,—the population of college graduates turned out to be disproportionate in terms of both its size and the relevance of majors. These disproportions contributed further to the devaluation of college diplomas.

Along with the increased demand for college-educated employees, the demand for skilled workers and mid-level specialists also remains high in today's labor market. According to a national survey (conducted as part of the Monitoring of Education Markets and Organizations) of employers that hire workers of general trades and specializations, 29% of surveyed companies hired MLSP graduates and

31% gave jobs to SWP graduates in 2014–2015. For comparison: recent college graduates were employed by one third of the surveyed companies [Bondarenko 2017:18]. A certain proportion of young people use vocational education under mid-level specialist programs as a detour road to college. Consequently, most of the vocational education system (mostly MLSP) does not actually serve its inherent purpose of supplying the economy and society with mid-level specialists.

Higher salaries are an important factor driving mid-level specialists to move from their careers to those of highly qualified specialists [Gimpelson, Kapelyushnikov 2007:368–370]. But there is more to it. Working outside one's major has become common practice for both college and MLSP graduates in the fast-changing labor market of today. Career conversion and aspiring to higher levels of education is becoming a relevant problem for many youth categories. A longitudinal (ten-year-long) study of educational and career trajectories of youth in Novosibirsk Oblast shows that types of career conversion differ across levels of education. When getting employed outside their major, college graduates normally take jobs matching their high level of education. Meanwhile, graduates from vocational schools who fail to find a job in their major are much less likely to get employed in positions requiring a mid-level specialist qualification, part of them having their social status degraded or even losing their skills (by engaging in low-skill manual labor). This way, college education builds cultural capital which, should a career conversion be required, can be traded for an occupation equivalent to higher education in the level of competencies. In contrast, MLSP vocational education does not develop a set of universal competencies, apart from technical specialization, that would be perceived as a mid-level specialist's qualification in the labor market [Cherednichenko 2016:305–310].

Therefore, educational trajectories pursued by young people, who move from level to level in the education system, and opportunities for mobility within the system are contingent on a complex web of many interdependent factors. The latter include the structure and institutionalization of the education system, educational needs, and the selectiveness of young people. These factors shift all the time, depending heavily on the economic and social demand for human resources of specific qualifications and majors as well as on the existing vector of technology and social development. Both the education system and the labor market must undergo a transformation to solve disagreements that inevitably arise between them. For instance, devaluation of college education and the sector of low-quality colleges cannot be fought successively in a situation where only one part of the labor market seeks highly-qualified professionals, while the other, mostly represented by service agencies and small and medium-sized businesses, is well-contented with a diploma's social function of indicating that a college graduate has acquired a set of social and cultural competencies. The situation will only change when the secondary

and the tertiary sectors actually express a demand for high quality of youth education and most structural elements of the economic system actually focus on intensification, modernization and innovations in their development. On the other hand, the system of vocational education (mid-level specialist programs) will keep playing the role of an educational bridge until it upgrades the program content essentially and begins teaching the universal competencies of a mid-level specialist in addition to technical specialization. The challenge faced by the education system today consists in carrying out such transformations as to develop human capital that not only includes knowledge, skills and specializations but also embraces some broader competencies as well as proactive attitude and transformational leadership skills.

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Online Educational Resources for Schoolchildren and the Digital Divide

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Abstract

The authors examine the digital divides of the first and second levels and analyze the use of educational resources by Russian schoolchildren. Several specialized educational resources for schoolchildren are described. The first level digital divide is understood as unequal access to the Internet among different social groups; the second level digital divide means the differences in the practices of using the Internet. Empirically the study is based on two surveys of schoolchildren, conducted in 2014–2016 in St. Petersburg (94 schools, 3,739 pupils of the 10th–11th grades) and the Kaluga region (249 schools, 27,904 pupils of the 6th–9th grades). The results show no evidence of the first level digital divide in the megalopolis. In the Kaluga region, the differences in access to the Internet are due to the type of settlement (city-village), the family structure (two-parent/single-parent families), and the parental educational level. Schoolchildren living in a village with a less educated single-parent are in the most vulnerable position. No differences in Internet use were found between schoolchildren regardless of their family background, school type, or type of settlement, neither in the Kaluga region, nor in St. Petersburg. Most schoolchildren use educational resources, and the intensity of use increases with age. The most popular general purpose resource is Wikipedia; the most popular specialized resource for schoolchildren is Znanija.com. Only a small percentage of the surveyed schoolchildren (about 2%) use the sites that offer ready homework.

Keywords

first-level digital divide, second-level digital divide, internet use, online educational resources.

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What Future Awaits Universities

National Research University Higher School of Economics, Moscow, July 14, 2017

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Abstract. Which non-educational processes will influence the development of universities in 15–20 years? Whom will universities compete with? How will education markets change? What will be the relationship between future univer-

sities and external environment, society, government, businesses, and other universities? The future of universities is discussed between Yaroslav Kuzminov, Rector of the National Research University Higher School of Economics (HSE), and Dmitry Peskov, Director of the Young Professionals Direction at the Agency for Strategic Initiatives. The meeting was organized by the journal *Voprosy obrazovaniya*.

Keywords: tertiary education, university, education market, digital economy, platformization, risk maximization, customized learning, labor market, e-learning, Applied Bachelor's degree, innovations.

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Good afternoon. I don't know how familiar the Higher School of Economics is with this meeting format, but personally I see it as a rare opportunity to listen to a dialogue between two of the foremost experts in Russian—and, broader, global—education, whose views sometimes align and sometimes differ, though are always very interesting. We are talking about the future of universities today. The subject will be discussed by Yaroslav Kuzminov, Rector of the National Research University Higher School of Economics, and Dmitry Peskov, Director of the Young Professionals Direction at the Agency for Strategic Initiatives. The conversation may grow a little futuristic, but I believe we'll be able to avoid losing our heads in the clouds because both Yaroslav Kuzminov and Dmitry Peskov keep their feet firmly on the ground and understand the existing situation in Russian higher education as well as the global trends. They have an extensive background

working in our universities and thus can provide adequate assessments. *Voprosy obrazovaniya* journal, which organized this meeting, set the time frames we will be talking about at 15 and 30 years from now. This future is not too far, it is pretty foreseeable. If we talk about the next 15 years, looking to 2030–2032, this is the period for which major national development documents are designed, and I know that HSE experts and Yaroslav Kuzminov himself have already been deeply involved in this. Dmitry Peskov has led a foresight project since 2011, trying to visualize education in 2030, including universities—so, the subject is all too familiar for the discussants.

Our speakers will be asked to discuss three, maybe four issues in their speeches, but they will be free to extend the list. Time will be our only limitation: each of the discussants will have 20 minutes. The first topic to cover questions which large-scale social, technology, economic and geopolitical transformations will take place in the next 15–30 years, and how those exterior transformations will affect universities and the higher education system as such.

The second point we would like to touch upon is: what will university's main activities be? Will it retain its functions and roles, or will the “stuffing” change?

Question number three is a very important one to avoid being university-centered in this discussion. What will the market of 2030 or 2060 be like, and what will the role of university be in this new market? Whom will universities compete with in those markets and who will be their partners? This leads us onto another one: how will university's roles and probably functions change in the context of its environment, society, the government or even governments, businesses, organizations, and other universities—if there are any left at all.

As soon as the discussants have presented their visions of the university of the future, they will have five or ten minutes to respond to the arguments of their opponent, or partner, or colleague—whatever roles they assume. Next, I will use my opportunity as moderator to ask them a couple of questions, and then our colleagues from the audience will also be allowed to ask their questions. I am sure that, as in *The Master and Margarita*, “some chess journals would pay a fortune to be allowed to print it.”

So, this is our framework, and this is where I'm giving the floor to our participants. However, before Yaroslav Kuzminov and Dmitry Peskov start expressing their points of view, I would like to ask them one specific question. Yaroslav Kuzminov represents the university he has been working for, and he has been deeply involved in higher education, so I believe the university environment is one of the most important things in his life. Although Dmitry Peskov has extensive experience working in university and with universities, he assumes a slightly third-party perspective today—that of an expert. In this regard, I believe, university is perceived in different ways by our discussants. So,

do you see the university of the future—the one you will be talking about—as a subject or as an object?

Dmitry Peskov, *Director of the Young Professionals Department at the [Agency for Strategic Initiatives](#)*. Thank you very much. From my current perspective, university is naturally an object today, and we engage in designing that object. How to combine such objects and how to change their form to solve specific problems is what has been on our minds at least over the last six years. So, what we do is purely applied thinking: we devise ways to use university as a tool, not as a value in itself.

Yaroslav Kuzminov, *Rector of the NRU HSE*. Well, it is clear that university for me is a subject, a collective subject. What is the difference between university and enterprise, for example? Enterprise owners may treat their employees as factors of production, which means they can replace them with other employees or new equipment as soon as it becomes more profitable, and this never raises any questions. Employees can work “from here to here” and that will be fine in terms of the outcome. University is a different thing. Whoever its formal founders and “owners” are, the real participants of the organization called “university”—its co-owners in fact—are its professors, teachers, and students to a lesser extent (although in some institutions students also feel their responsibility and their rights for the university). In this regard, treating university as an object is wrong and even dangerous. Any education reform will be put at risk of failure if we devise flawless optimal patterns but never make allowance for the sentiment inside those patterns, which may bring down virtually any reform. If a teacher who has been given a salary rise but who has also been made to work excess hours and spend two hours a day reporting—if this teacher responds in a negative way to our efforts and concerns, the reform will ultimately fail. The same works for universities: programs fail if professors cannot feel themselves part of them. So, of course, university is a subject, a collective subject. Every single university has its subjectivity, which is never represented by its rector but by a complex, elaborate faculty system.

Arzhanova. Well, these are our starting positions, and now we can listen to what Dmitry Peskov and Yaroslav Kuzminov have to say about future universities, or the university of the future.

Peskov. My points come down to the following. ‘The next 20-years’ scenario is pretty clear to those who design the future in terms of one pivotal trend—the trend of technological revolution, a subtype of which is the tendency towards global digitization and digital mediation. This trend seems fundamental to me, as it changes all the established models, in terms of their content as well. Whereas employees

used to be treated as assets, the new logic turns successful enterprises into joint-stock companies where most workers hold a share of the social capital. In this sense, enterprises become more like universities. To my opinion, the trend towards technological revolution and digitization is mediated by two other trends, equally important but unable to change the main vector of development. These are economic and demographic trends, which I merge into one on purpose, on the one hand, and geopolitical and ideological ones, on the other. In fact, these are Scylla and Charybdis for the process of technological change that we are going to observe in the 20 years to come.

I'm focusing on the 20-year period because my prognostic abilities don't work beyond this horizon. Beyond it, we will enter an era where even the economic trends that used to seem unshakeable... Because what is our normal way of reasoning? Well, we have nuclear power plants, or railroads, or large passenger aircrafts which have a lifecycle of 30, 50 or 70 years, so we can calculate the payback period and develop business models. But what is beyond this 20-year period, beyond the year 2035 is what gamers refer to as "the fog of war", i. e. trajectories barely discernible.

So, we have the basic trend and the trends that can slow it down or speed it up. Meanwhile, constant acceleration is the key property of technological revolution today, i. e. every new wave comes sooner than the previous one, which makes forecasting and responding even more challenging. If we look at our own products, for instance, the *Atlas of Emerging Jobs* seemed absolutely radical in 2011, while now we regard it as conservative. A number of transformations come much sooner than we expected.

How do universities respond to those trends today? I think we shouldn't paint them all with a broad brush. I distinguish between four types of universities in the modern world. The first type is the old "cloakroom" model, i. e. everything that works in analogous economies; this is a social function of retaining active young people at a certain age. The second type—let's dub it "growth servants"—is when university solves applied problems to ensure a rapid growth of relevant economies. It used to be typical of Russia at one time, probably in the 2000s, whereas now this is an ultimate characteristic of South-east Asia and Australia. Another type is universities that foster cultural monopolies, i. e. leading British and French universities that still exploit the legacy of their countries as once cultural empires, collecting "cultural rent" from students who come to study there. Finally, "funnel-type" universities: they also include some British institutions but are mostly represented by leading American universities. Their situation is unique in that they don't need to build full-fledged ecosystems, being oriented towards attracting talents from all over the world and seeing themselves as such "funnels". And then, as they say, trash in—trash out, genius in—genius out. That's what the Harvard model is: if you gather geniuses from all over the world, they will yield a perfect

outcome even if you make next to no effort. Meanwhile, I have never seen a modern university model that would be adequate to the challenges of the digital economy. There is a typical process proving the inability of universities to meet those challenges: the major players in the global digital economy—most often understood as the world's 7–8 largest companies that lead the global digital transformation today: Microsoft, Google, Facebook and Amazon in America, and now Elon Musk's industrial empire will probably join them, plus three Chinese giants—do not engage in symbiotic collaboration with universities, instead training experts inside the company, thus acting as “funnels” too or designing learning and training processes of their own.

I would single out four requirements that the digital, or data, economy will apply to economies and societies within the next 20 years. The first one is, of course, to develop thinking skills, as people capable of thinking and building their own models instead of working with someone else's are of paramount value to the data economy. Meanwhile, templates constitute the cognitive basis of teaching in the great majority of modern universities, i. e. students are largely taught to think templates. Even the most advanced education models do so; consider Harvard's case method, for example—it is also about templates and reproducing practices of the past. The second requirement is to encourage risk taking, because the newly-emerging reality requires taking risk all the time, so the risk maximization function is needed. Meanwhile, by actually creating a sort of graduation “bottleneck”, universities force students to adopt personal strategies of risk avoidance instead. Requirement number three is speed, which means the data economy wants immediate results, whereas universities operate on an interval basis. Finally, the fourth requirement is customization—and universities mostly deal today with mass processes.

In addition, we need to discriminate between universities based on their motivation models. “Cloakrooms” often use the model we can define conventionally as “without regaining consciousness”: students don't need to think; they work within industrial models, and nothing special is expected from them. A number of universities comply with this requirement pretty well. However, a much more significant role is played by the 15% of universities that use role models and the 5% of students capable of setting personal goals. It seems to me that the value of classical universities is plummeting as students approach the “bottleneck”, being the lowest for those 5%. Unfortunately, experience and statistics indicate that this distribution persists, i. e. the overwhelming proportion of students give up university because of lacking motivation, while those who go all the way and obtain excellent results make up the student elite of modern universities. I believe this fact proves that low motivation is not the fault but the problem of education systems all over the world today, and the mass motivation requirement is a foremost challenge posed by the digital economy.

The Russian education system today is entering an extremely complex situation where two barriers prevent it from satisfying the data economy's needs. The first one—I would call it the basic effect of all the Russian educational policies over the last decades—is that educational policy makers, to whom I attribute myself, have recently been facing a conflict: the better we train professionals for the existing analogous economy, the less chances we have to build an economy of data, a digital economy. It's simple logic: if we reproduce the model of dual education and industrial departments, maximizing the function of relations between university and the primary sector, university and the existing economy, it means we barely have any human resource for the breakthrough. It means only a thin streamlet is available for startups. In this regard, the better we work, the worse it is for the economy.

The second inhibitor is the cognitive barrier. Since we cannot take new human resources, and given that the demographic trough is going to reduce the population of graduates by half in years to come, maybe we should retrain our old human resources? Well, it turns out we can't: advanced training programs existing within the analogous economy do not work at all because the competency framework is totally different, the requirements to competencies are totally different, and no one even knows whether we can retrain human resources quickly and effectively. I haven't seen an answer to this question in terms of systems analysis and statistics yet. And this means that universities still have some irremediable defects that will prevent them from fulfilling their key function in the future.

The first of those defects comes as no surprise: universities are prisoners of CAPEX. They live in buildings which are too expensive, and this is bad for thinking. In fact, thinking that students develop is largely inflicted by the traditions embodied in the eternity of university buildings and other related values. Uniformity of education is another irremediable defect of university. In fact, the "four plus two system" (four-year Bachelor's degree plus two-year Master's) and other predetermined formats of uniform education do nothing but sacrifice talents for the retarded students. Thirdly, the possibility of concentrating the best teachers in one place entails quality deterioration and template thinking. Fourthly, universities operate in a competitive environment, while the modern market requires not only competition but also platformization above all. Finally, universities' time-consuming processes of procurement and everything else do not allow for using the latest technology. At the same time, it is clear that some functions typical of universities will survive and remain critical, including the development of fundamental thinking, the formation of relations and student communities, the traditions, and what is referred to as "science schools". I guess all of this will undergo a drastic change some day, but not within 20 years, rather within the period of 50 years, the second timeframe proposed for discussion.

Now, as for university's roles and functions in the global context, I think we have treated those roles as attributes for too long, and this has been quite a mistake. We would talk about teachers' university, research university, then entrepreneurship university, etc. Any phenomenon of social life undergoes an essential transformation at some point, and it's time for university to do the same thing. From the economic perspective, universities must become generators of new industries, new business models, and new companies. They must reject their passive stand and engage actively in creating all those new things because there are no other actors capable of fulfilling this ambitious function with due regard to the technological revolution requirements. University must interbreed its model with that of venture funds, not only those investing in startups but also those investing in talent. This function is not yet assumed by university, so return on investment should be introduced as an economic function of tuition fees; and, of course, the function of knowledge generation and translation will be maximized in this model quite naturally. However, this function is not analytical, rather projective or associated with the emergence of new industries.

I believe new university models are possible. We have analyzed potential revolutionary university models, which are available today in some parts in the world but not in Russia. And we have identified a number of functions that could be underlying those models. For example, the function of world modeling—we call it *setting university*. This is a function of maximizing the function of world modeling, i. e. squared modeling function, where the university trains, figuratively speaking, demiurges capable of modeling and creating worlds around. Next, the function of resource maximization. For poor economies, we should have the function of resource hyper-concentration. As a policy maker well known to us has said, "Russia only has resources for one university." Then, we should maximize the function of startup generation—the model that we refer to as *rocket unicorn university*, i. e. university that generates unicorns. Next, the function of ideology maximization, which is manifested today in the *singularity university* model. This is an ideological university, which may well have a competitive model of a similar type. Then, the function of maximized motivation, where we solve the problem of 80% of college and secondary students who have no interest in learning. Next, the function of maximizing talent discoveries: it's curious how we raise talents to satisfy some predetermined requirements, while the world and the revolution want maximized extremes, i. e. encouragement of any talent sprouting in any area. Then, the function of maximizing the competitive advantages of the Russian economy, first of all in terms of digital economy, programming and companies operating on a global scale. And then, the function of challenge maximization, when university dedicates all of its mission to creating a single revolutionary product that will change the world. Finally, there is *Russian fundamental univer-*

sity, i. e. maximization of accumulated research capital. That's what they discuss today in terms of the elections in the Russian Academy of Sciences: how to create a single large-scale network research university based on the achievements of Russian science. Well, there is probably one more—the function of ecosystem maximization. It consists in involving as many people with relevant competencies as possible to solve problems in teaching, which is limited today by the regulatory framework set by the regulating authority.

So, here are the new models, none of which is represented in the market today. This is our semantic field, in which we reason about the future and the new types of university that may emerge in Russia. Thank you.

Arzhanova. Thank you. Maybe a couple of words about whom universities will compete with?

Peskov. Everyone competes with everyone in each of these models, because university is a function, not a location. Each of these models develops a function to maximize its own competitive advantages. As they say, everything you touch becomes a university. Again, everyone competes with everyone for the key to the holders of our identity, whom we see merge today. So, who are these holders of identity? They are banks, social media, national regulators, mobile operators—in short, institutions to which we entrust our identities today. Platformization logic will demand that these providers of identity keep merging. Will university be able to become such a provider of human identity? Yes, if we succeed in constructing a lifelong learning model, allowing the university to assume this important function. However, I'm afraid this requirement is beyond the power of the existing university system, which has neither the hands nor legs or any other organs to do this.

Kuzminov. I think we should identify the factors that will determine the development of tertiary education within the next 20–25 years. These factors can be recognized and outlined today. We might misestimate them but they can certainly be named. The first one, and Dmitry has mentioned it, is the qualitative transformation of the role that human capital plays in the economy. Fifty or sixty years ago, when Gagarin flew to outer space, the percentage of people who were paid for creating innovations—not by chance but in response to an order and as part of their direct responsibilities—was extremely small even in the more developed economies. Nowadays, experts that are hired as innovators and paid for creating new things instead of replicating the old ones make up at least 20% of the labor market in developed countries. This is apparently a trend now: their proportion will increase even more, almost reaching the size of the middle class, which is the largest stratum in the more developed countries, as compared to 25–35% in Russia and China. This is a sort of new middle class, the creative mid-

dle class. It will shape the demand for universities that don't replicate knowledge or impose templates but teach to be creative and justify innovations. In this sense, we can expect the Humboldtian university to be reborn from this trend, however strange it may sound, because constant engagement with science and constant denial of the old patterns were exactly what the 19th-century Humboldtian model was built around. The only difference is that it was designed for the elite back then, while the version of tomorrow will be for everyone. So, university will develop a demand for creative thinking and ability to justify innovations.

The second factor consists in the fact that productive life will become much longer. Even today, life after university is half as long as a generation ago. Productive lifespan is more than 70 years now, and there is every chance it will increase by another 15–20 years by the end of the period we are looking at. Together with the next factor of constant technology upgrade, it will instigate a steep increase in public demand for lifelong learning. This term has unfortunately become overused and trite, but I still insist on using it as a perfectly legitimate one. It is not continuing education, it is exactly the demand for learning new things throughout one's life: at least up to the age of 60 mostly for earning purposes, and later for self-development. This demand will develop a huge sector of competitors with the existing formal structures (universities). The new sector will include both training centers within corporations and specialized education startups born in the market. That is, the greatest challenge for university to face is being created by a rapid growth in unconventional demand. Universities are too inert to satisfy this quickly shifting and deeply individualized demand, which inflates the possibility of another wave of commercialization in education.

The fourth factor is the rapid growth in effective demand for education. Commercialization of education does not depend on the desire of universities to sell their services; rather, it depends on effective demand. The urban population moves massively into the middle class. And what is middle class? This is an economic situation where people can select vectors and forms of their consumption, where they spend most of their earnings not on the products to satisfy their physiological or routine needs but on something they can choose at their own discretion. Middle class is free consumers. This expanding field of choice will ultimately embrace effective demand for education. We can now see how people have become more willing to pay for good and better education for their children over the last five years. The most recent Monitoring of Education Markets and Organizations in December 2016 found that 31% of respondents were ready to spend 5% of their income to provide decent education for themselves or their children. Another 10% were ready to spend 15% of their earnings to ensure the best possible education for their kids. That makes over 40%, which is nearly half of the population! These indicators are

extremely high as compared to the 2011 survey results. So, what will the growth in effective demand entail? The same new forms of education provision I have mentioned before; in addition, universities themselves will enter the market more actively. I have no doubt that newly-emerging training centers, education startups and small educational companies will move ahead of them. There is a strong presumption that universities will later buy those startups, just like pharmaceutical giants buy pharmaceutical and chemical startups, but it will anyway be a perfectly natural, decent, highly cost-effective niche that will fuel the economy.

The fifth factor is a global language. English will have become a global professional and business language. It is actually becoming as such in front of our eyes. National borders are vigorously erased whether the states want it or not, and it means that the market of education—at least tertiary, but very likely secondary schools too—will be globalized. Competition in education will shift from national scales to the global one.

The global spread of English has the same vector as the sixth factor, namely the development of e-learning and the revolution of online courses. What's the revolution of online courses? People will see that they can take a course directly from a Yale professor instead of listening to a bad, stumbling lecturer who hasn't read many new books. They will see that, instead of learning a production process on obsolete, poorly functioning equipment in their trade school, they can find some outstanding formats of doing so with more advanced technology online, either in the local market or, say, in Australia. This opportunity is provided by simulation software that can be accessed online—the problem thus comes down to Internet connection speed. New opportunities will upset the applecart in higher and applied professional education—and in all other types of education as well—as early as ten years from now.

The seventh factor is changes in the labor market. As I have already said, we will observe qualitative changes in labor as such, and Dmitry has mentioned that competencies and qualifications in the market will keep upgrading. Hence, along with college degrees, there will be a great demand for professional certificates and micro degrees indicating that someone has attained a specific level in, say, system programming, health technology, etc. Curriculum vitae will not be restricted to a college diploma anymore but will be composed of such indicators, such micro degrees. That will be another challenge for universities, as they will definitely want to be a part of this micro-degree system. In fact, many have already engaged somehow in this game—take Cisco Innovation Centers, for example—but this is no more than 2–3% of everything that universities offer in the market today. Now imagine a situation where this type of offer amounts to 30–50%. We can only guess how universities will be reorganized under such conditions, but obviously the reorganization will be in-depth.

How will the structure of higher education change under the influence of all these factors? New stable segments will appear in virtually every country, with the exception of the poorest and the least developed ones. Global research universities will emerge and develop as project universities in addition to their research activities, generating a network of startups around them and providing a fertile ground for alumni's new businesses, social initiatives, clubs, etc. This is where I also agree with Peskov, this is for sure. Such global projects and research universities will appear in every country as capable of competing in the new global education system, at least by means of acceptable quality combined with low costs or as "bridges" to the vast regional market.

What are the parameters of global competition? First, salaries. Russia's leading universities pay their professors about 4–5 times less than the average salaries in universities of developed countries. Patriotism is helpless here; low salaries can only be tolerated through inertness, getting used to low pay—a poor ally in the process we are talking about. Inert professors rarely make good innovators. That is why having a group of leading universities competing in the global market is an issue of national safety for any state, and we will soon have to spend as much as we must, not only on aircraft carriers and missiles but on brains as well. By the way, it is not only about universities; it also concerns research centers, corporate labs, etc. We cannot keep surviving by inertia with salaries in science, education and medicine 3–4 times lower than in leading countries. So, the number of such universities will correlate positively with government revenue. In Russia, there is a possibility to recreate and sustain 25–30 such universities within a decade at a relatively relaxed pace. If a lot of effort is invested, the number will increase to some 50—and that will still be too low. We need to find an asymmetric answer to this competition, because if we have as many global universities as Germany or France, which are much smaller countries, it means we are facing a very serious problem and a very strong challenge.

Another problem is that our 5–100 Group, once criticized by Dmitry Peskov, is indeed structured in a weird way. It includes a few aerospace engineering universities but no transport university, no agricultural university, and only one medical institution. And this is certainly weird, because our country needs a global level of technology in every industry. It cannot be an excuse that those universities did not provide adequate programs. Well, let's bump the management, do something else, but we cannot possibly abandon the transport industry or agriculture. There are a few more industries where nothing has been done so far to create universities of this type. I am talking first of all about arts, where economic significance is growing, plus construction and service technology.

Another important category of universities is represented by institutions unable to compete in global science but indispensable for

providing “centers of intelligence” in regions. Their primordial function will be the social one of raising local businesses and social projects and creating a broad cultural horizon. The same will be true for the first category of universities, but those will have international laboratories, while regional institutions will have some local lab elements. By the way, I consider it very important that we provide an infrastructure to support such decent regional universities, each with at least two or three strong labs, because if the ceiling is low... well, you can't duck all the time, right? Regional universities will be able to replace a large part of their basic courses with granting credit for the best online courses, thus saving funds to invest in real, unsimulated science.

Yet, the extended university function that Dmitry Peskov talked about—and I fully agree—will be fundamental for the key regional universities. Let's take business incubators and business parks that exist today in nearly every region and show little efficiency, make this “innovation belt” part of universities, and provide these universities with some basic funding to retain the best quarter or even third of their graduates, helping them create new forms of activity and projects. There is virtually no alternative to this solution in the regions. We should not forget that university is a fostering environment. So, this function, this format of universities as regional centers of intelligence and creative thinking is absolutely indispensable. And, it will be better if there are at least two in every region, since if there is only one, there will be risk of stagnation. That is, we are talking about approximately one hundred universities of this type around the country.

The third type should involve universities that basically provide e-learning services. Half of the college students in Russia are enrolled extramurally, and the trend is going to persist. In fact, these universities help people construct degrees from numerous short courses they have taken. Why can such degrees not be awarded by universities that provide those online courses? Because that would jeopardize their reputation. I cannot see any incentives for leading universities to award their degrees to a much larger population of students, obviously less skilled than their current graduates. Hence, there is a platform for such “construction set” universities, in a good sense. They have another important function of local consulting, i. e. providing local support to online students. Such universities will exist for sure, and their mission will be to ensure maximum participation rates in higher education, which is a social imperative for the population of any developed country today.

The fourth type of university is what should evolve from today's trade schools. This is now referred to as applied Bachelor's degrees, but there is more to it. Manual occupations will become sought after and highly prestigious in the labor market of 2030. Even now, look at a chef or a good hairdresser: these people are at least as respectable and smart as professors. This sector will grow and expand, and there

will be large categories of occupations involving complex routine operations but higher responsibility. Why is an aircraft pilot expected to have a college degree or even two and a train driver is not? Their levels of responsibility for human lives are pretty much the same. In the end, a huge proportion of a doctor's work is about executing protocols, but no one says a doctor doesn't need a university degree. So, a cultural cushion is required for the new generation of manual workers; they won't account for more than one third of the future economy but that will be a very important and respectable one third. And, of course, specialized vocational schools should exist, similar to acting ones. A number of Western-European countries have already introduced them, so we can learn from them how to train chefs, cabinet makers, bookbinders, etc. The narrowest specializations are available, and even in variations. You can simply learn bookbinding or enroll in a program with a number of courses around the books of the 17th century that you bind: what the 17th century was like, what its culture was like, and so on, so you accumulate a certain body of seemingly optional knowledge. What actually is the crucial point of the university and why, I am perfectly sure, will it survive as an environment? University is a lode and generator of optional knowledge—a kind of knowledge that you don't have to apply professionally but which may be applied at your discretion, unexpectedly for others. You don't just put this knowledge on the backburner but obtain it because you are into it. This property of optionality will become extremely relevant in 10–20–30 years. And what is optionality? It's creative thinking. This is when we generate something new ourselves, if you like.

We can find some other formats too, such as corporate universities that will obviously evolve. However, I would like to dwell upon commercialization of education, upon commercial projects in education paying their way.

What can educational business become like? First of all, it will grow around universities because innovators who own intellectual property or a part of it naturally want to capitalize on their innovations—not always but quite often—and feel themselves entrepreneurs. One of the key challenges for the lawyers of the future will be partitioning intellectual property, i. e. intangible assets created, say, by a university professor in her lab. To what extent can she use this property and appropriate the results exclusively? Where are the limits of the rights of her university and colleagues? Colleagues' rights are a more intricate issue than those of a university, by the way. I believe the next 20 years will be filled with hot debates over intellectual property rights, legal battles and so on, as happens every time a newly-emerged phenomenon is not yet formalized in legal practice. My forecast is this: at least one third of offers in the education market of 2035 will come not from universities but from corporations into which large publishing houses like Prosveshchenie or Drofa will have evolved, as well as by corporate training centers, education startups and specialized education-

al companies, though I think the average lifespan of such companies will be relatively short.

Now, I would like to touch upon the subjects that Dmitry has brought up. He listed numerous university roles: generators of new formats, new associations and new businesses. I agree: universities can and must generate new formats. However, it should be done not by the academic council but by alumni, associate professors, i. e. individual people retained by the university. Why should they be retained by the university, why do we want them to stay in its zone of influence? Because university is a huge network of free communication, where information, speed of access to it, and trust-based relationships are the greatest values of all. How did Silicon Valley appear? Through immense concentration of the brainpower and businesses that use it. Universities are similar points of concentration and intellectual exchange. And you don't have to pay for searching, for making contacts, for the opportunity to have a breakfast with Warren Buffett—you get it all for free because you are part of the system. This membership, this being part of a specific community will definitely work and may even become the primary prerequisite for success, provided that the role of information as an economic resource keeps growing. Moreover, this will provide a means of attracting alumni back to universities by offering them low-cost comeback opportunities.

Now, what concerns university defects. I'm not sure I understand what eternity of buildings means, so I would rather define it as inadequate investment. I think the successful development of the HSE is explained, among other things, by adequate investments from the very beginning. It was a tough issue of space during the first 15 years, but we decided we would only invest in faculty and libraries.

I remember driving in St. Petersburg with a rector and seeing a building with a marble front. I asked, "Whose is that building?" "It's such and such university's." "What salaries do they pay if they can afford marble?" "No way, they pay a pittance!" And that was when I got the strategy: as a bad rector, you may never raise salaries to survive; instead, you may build fountains or marble façades, i. e. make investments that have nothing to do with professors. Why? Because the feudal university model of the 1990s was based on non-involvement. A professor paid 6–8 thousand rubles cannot make a living, so he naturally looks for additional sources of income. And if he only earns 1/5 of his income at the university, he will never team up with other professors to tackle that stupid rector because emotional costs and possible monetary gains will be absolutely disproportionate to his efforts and losses. However, if the same professor gets 70% of his income from the university, he will become dangerous, as he can vote against you and drive you out. At meetings of the HSE Academic Council, at least 20% of draft solutions proposed by administrators are rejected in their original versions. Newcomers watching our passionate debates sometimes think a revolution is about to happen. It's just that mem-

bers of the Academic Council perceive the university as their home, not as an institution that invites them to give lectures.

By the way, that university with a marble façade does not exist anymore.

I have known perfectly honest rectors who invested in passive assets and erected buildings. I can understand them, but investing like that is wrong. Even five square meters per student can be enough. We now live with eight square meters per student in the HSE, and everyone thinks we're well off. We always run low on materials and resources, and I know a few other universities in the same situation, such as Plekhanov Russian University of Economics or ITMO University. So what? Does anyone care? Quite the opposite: everyone believes these universities are cool. Meanwhile, universities that boast 30 square meters per student but invest in passive assets often lag behind. I would probably agree that this is a defect of university, but I don't think it's irremediable. It's just that these passive assets lose their importance as society is growing richer.

Uniformity in education is a very interesting point. Indeed, it puts the brakes on both university and school education. As a mechanism, the education standard is designed to have everyone complete the program, but we will always have underperformers and top performers. Is there a way out of this situation without the need to refuse uniformity, which structures university activities and saves a lot of assets? Yes, there is one: underperformer support tools coupled with labs for top performers. Thus, top performers will have access to an additional track, while at the same time providing guidance for low performers to keep them in. However, the problem is not specific to the university, being typical of any education system and even much more acute in school, where children are unprotected and unable to stand up for themselves or even, not infrequently, explain what their problem is.

It is possible to concentrate the best professors in one place? I guess the online sector makes this task feasible.

As for the rigid and ineffective financial model, the first thing to do is solve the problem of underfunding with the help of the government and any other university founders. That is, university's production function must get rid of its current distortions, when labs stall with no money for chemicals, or when professors are finally paid enough but there is no manager in the department. As soon as there is sufficient funding, we will be able to discuss financial policies. Today's university financial model is invalid first of all because universities receive almost no subsidies for new equipment or building maintenance—about one third of what is needed—and no adequate funds to pay at least 50,000 instead of 10,000 rubles to teaching staff members, so that we could find decent professionals at those salaries... I am convinced that financial models must be discussed in a broader context, with due account taken of governmental and societal obligations.

Arzhanova. Thank you, Yaroslav. Dmitry, do you have anything to say, any questions to ask, points to comment on?

Peskov. Yes, I do. I see that we agree on most points: national policies in university development, the future of Project 5–100, and the idea of having leading specialized universities. However, I think this logic requires additionally answering the question of which technology solutions will help us ensure the leading positions for such specialized universities. The thing is, the key technologies shaping the future are much less numerous than relevant industries and domains. Roughly speaking, the basic technology package is more or less the same across all industries. The link “big data—AI—blockchain” is equally important for institutions in transport, agriculture and even humanities. I don’t think the country has the potential for creating 20 or 30 universities with equally strong schools to provide such specialization. We need a situation where universities ensure their own specialization through customizing the content of education, while sharing the same technology platform, or maybe a few such platforms. It is only this type of weird synergy that can provide us with high quality, because we don’t have the minimum sufficient human capital to implement other variants.

What I’m not quite sure about is the social imperative of higher education. I think this imperative is a legacy of the previous global and Russian trend, but it has mutated greatly. Fifty-six percent of middle school graduates preferred trade schools over high school in 2017. Even if we take into account that their choice was largely inflicted by their fear of taking the USE exam and they were still going to enroll in college some day, the amount and value of practical skills increase considerably. I believe there is some perception of university as the exclusive generator of optional knowledge, inherited from the past. Don’t games and social media provide people with the same social ties and optional knowledge? Don’t people obtain the same through micro degrees or micro models of social communication, like at a fest or in a camp? They perfectly do, and such social ties turn out to be quite effective in terms of friendship and community values. Let’s compare who is stronger today, Harvard alumni or “alumni” of the Burning Man, the large-scale annual gathering in the Black Rock Desert? I’m guessing that Burning Man outdoes Harvard several times by the level of cultural transformations that people undergo when building social ties. It seems that universities are being denied this exclusive function as well.

And the last one. When I was talking about financial models, I meant not only and not so much underfunding—this is the *minimum minimorum* for any discussion, I totally agree—but also the ability of universities to attract and design new investment models. Investment models are actually what shapes communities, we just haven’t yet come to the point of this logic. I know what will happen when and if the

HSE wants to create a full-fledged community and get back not even to the Humboldtian model but to the medieval university of the 14th century, which is also feasible today. In that case, the HSE will consider IPO and the so-called “bounty professors” will appear. Investments that can be attracted in this new technology-based reality are considerably greater than those that can be seized from the government. So, these are the marginal notes I would like to make, although we’re certainly thinking in the same direction on the whole.

Kuzminov. Dmitry has made some very interesting points that I will try to respond to. The first one is about the technology platform that will be shared by a group of universities. Clearly, we’re not a very rich country, so we obviously need to begin with a shared knowledge center to construct such systems. This idea has long been recognized. As you know, only 20–30% of equipment capacity is used in various research centers, even corporate ones, so this is the first thing to do when it comes to asymmetrical answers. If the Agency for Strategic Initiatives works with us in this direction, we should explore and report to the government: look how many empty spots there are, let’s announce a competition to fill them with users, so we can create new research teams, new opportunities for research and training out of thin air. I think this proposal is very good and right, so I cannot but vote approval.

The alternative university point is a very curious one. To what extent is the university able to lose its role of the social imperative? Only history will tell. But I think I have already made my fundamental argument: university is an immense community with minimized costs of communicating and obtaining information and access to various associations. Festivals, independent search, forums and interest groups are much more local than universities. If we look for no-university forms in the future, it must be some large online network associations. To what extent they will be able to provide an alternative—well, let’s see, because we have agreed that a lot of things cannot be figured out, only vectors can be identified.

As for the choice of vocational trajectory, Dmitry has already said that 80% of trade school graduates enroll in colleges within a year after graduation. Over 60% of them do not use their acquired knowledge and skills at work in any way. I’m afraid today’s vocational education model needs to get rid of people who are not willing to work manually, who don’t see themselves in manual careers and simply exploit the ingenuousness of the government that enrolls them in trade schools and hopes they will become manual workers. One simple thing needs to be done here: the USE should be made the only admission test. Then, we will again have 20–25% instead of 56%, but those will be people actually willing to work. Twenty percent of middle school leavers and 10% of high school graduates—that’s the adequate size of the cohort of qualified and responsible manual workers that society needs.

However, we should find ways to prevent secondary schools from pushing their losers to this track. Manual work requires special aptitude and talent, which must be encouraged by the public and inculcated through professional success stories, through technology that children will consider cool. Therefore, these policies and new technology should be applied not in high school but at least in grades 5–6.

The idea of academic community capitalization and university IPO sounds interesting to me. If the value of communities, communication and access to information actually increases and can be capitalized on, universities will have to use the opportunity and capitalize on themselves—and become corporations, if you like. Shareholders of such corporations will not only earn money on their shares but they will also have better chances for social advancement and education of their children. This option seems to be a good one for leading universities, at least an interesting one. I doubt we will have mastered this format by 2025, but the vector is quite palpable.

Arzhanova. Thank you. I might be wrong, but your visions look like totally different pictures of the future to me, despite your agreement on many specific points. While Dmitry talked more about the transformation of university, its borders virtually becoming blurred, and its existing formats being at least ineffective in their future content, functions and roles, Yaroslav believes that universities of the future are clear and well-defined institutions that are still dressed in their buildings. They have different missions, opportunities and objectives, but they are still part of the evolution pattern that drives today's system of higher education. That's how I see the speakers' viewpoints, very different in their nature.

I've got two questions for you. First, suppose that we put aside the economic needs and digitization and talk about people: the future children that will enroll in universities—or parents sending their children there—what will they seek first of all? Will it be important for them to obtain a set of competencies, which can be acquired as a package from some companies, some institutes or universities, and develop a unique body of knowledge and skills with a focus on salary, employment, and position in the national or global labor market? Or will those children 15–20 years from now chase brand credentials that will literally become lifelong trademarks indicating that you have graduated from Harvard, HSE, MGIMO, etc. and confirming a specific level of knowledge, capabilities and status that you have attained? As for all the rest, you just take it from those supplementary companies absorbed by the university or affiliated with it. What will people seek? Anyway, the university's primary customer is people, who may give no credence to national or economic policies but still want to obtain some specific type of education in a specific university.

And the second question right away. Both Dmitry and Yaroslav said that universities, especially leading ones, whatever form they

will take, will produce new industries, new domains, new majors, and other new things instead of responding to or restraining the external factors. So, the question to both of you is: where do you think Russian universities—not some abstract ones or 5–100 leaders—will draw strength from? Even if the government makes some effort and raises the size of funding, where will they take strength, ideas and any real trends from? Who will drive production of new things inside those universities? We've got the same staff today, and 15 years from now today's newcomers will become part of a new crowd that has spent its whole life in the university. They will get bogged down, too, in this environment that provides unique opportunities for socialization. Who will drive innovations in universities? What will make them do it? Thank you.

Peskov. May I start from the second one? I think regulatory regime is at least as important a prerequisite as funding. I strongly believe that the only possible format for leading universities is being part of such regime, similar to the Skolkovo Foundation, priority development areas (PDAs) and special economic zones (SEZs). Well, SEZs are mostly failing, Skolkovo works a bit better, and PDAs are more or less effective. However, under a regime like that, universities become corporations with a different fundamental management model and a managing company that assumes a number of functions. Universities in Russia have lately been created following this logic, we just haven't realized it yet. This logic underlies the two most recent universities, which boast the highest levels of expenditure per student, Skoltech and Innopolis. Innopolis is integrated into a SEZ, and Skoltech is regulated by the law on the Skolkovo Foundation. The same model is being customized today for the town of Yuzhny, which is going to be made a PDA. The same logic guides Far Eastern Federal University, which integrates its activities into the PDA regime of Russky Island. Such a regime is indispensable to “unpack” proactive attitudes, and it plays at least as important role as subsidies.

Who could be the driving force of changes? Well, it is clearly impossible to do in the brownfield and too expensive to do in the greenfield. So, my answer will be as follows: we've got the brownfield, in which greenfields should be sandwiched between the upper layer of managing companies and supervisory boards as change drivers and the lower layer and inclusions of individual model structures operating under the new logic, as well a system of benchmarks to encourage students and professors to move towards those model structures.

There are four sources of change, in my opinion. The government is the first and the most powerful of them: in particular, it will have to reshuffle rectors and form elite councils in a different way. The second source is naturally the alumni network. For instance, the association of PhysTech alumni is a very powerful driver of change that has a much greater impact on the university than the faculty members that

have the vote. The third source is advanced tech companies that will align themselves with the universities willing to try their luck and become PDAs. Finally, a critical source is school children and students enrolling in universities. Why? Because you have nowhere to adopt changes in technology and thinking but from these school and university students. Neither businesses nor alumni or the government can provide you with innovative thinking patterns. To my view, universities of the future are places where people and artificial intelligence learn together and learn from each other. Say, I need to inculcate the logic of working with AI within my small structure. We announce an open competition, and the only winner is a tenth-grader. So we hire him as a project manager and vest him with very important authority to change our digital systems to fit into the digitized future. He gives lessons and workshops, provides recommendations to our current contractors and elaborates the strategy of working with information systems. I haven't found this competence anywhere else in the country, only in this tenth-grader.

Arzhanova. But where do we find enough people to provide if not all...

Peskov. Easy: just buy all the prize winners of our National Technology Initiative Olympiad, they are all top-quality brainiacs. As soon as we scale this system from junior to world skills using our Quantorium tech schools, for instance, this cohort of population will hopefully increase. However, what Sirius Educational Center does is also a good way of supplying such human resources.

Now, as for the first question: what will people seek? I guess it will be a ratio of 80% and 20%. Twenty percent will seek capitalization on their talent. I think obtaining competencies in university makes no sense because over half of the necessary competencies will definitely develop in environments where they are applied as well. So, saying that university teaches competencies sounds really strange.

Arzhanova. The university provides this environment as such.

Peskov. Well, I doubt it. It has been long since it actually did. It is not the university where super professionals grow today. When you see those 12–13-year-olds that have already capitalized on themselves, where do you think they obtained knowledge above the university level from? They got it from online environments. As economy will advance, the role and weight of online environments will increase essentially in contrast to those of schools and universities.

Arzhanova. Won't it mean that young people will master some professional competencies perfectly but will still be unable to communicate with one another?

Peskov. They will have no problem communicating with one another and even swearing. Try living within a MMORPG online environment. This is a massive educational process today. Try playing Raid, look how competencies develop in there.

Arzhanova. I mean human communication.

Peskov. Well, that's exactly what it is. People form teams, identify the key areas of competence, agree to coordinate their activities, and undertake complex, socially mediated actions to achieve a common goal. There are all elements of a highest-level learning process there. I think that talent capitalization will remain the key function of those capable of setting goals for themselves, while those behaving as instructed by parents will go to university. I think degrees don't matter for 20%. We annually produce a few thousand graduates who have gone through the WorldSkills system. Do you think any employer has ever asked any of them which trade school they graduated from? The type of diploma does not matter to anyone anymore, and this is the reality of Russia in 2017. What employers want to know is whether you are a WorldSkills champion or not. Champions sell like hotcakes, no matter what. That's where the issue of uniformity is raised. If a first-year student wins the EU championship, why would she need all the other years at the trade school? You could appoint her as the director of this trade school, or as the chief educator, right now. She can do what the whole system can't, and she didn't learn it in a trade school.

Kuzminov. What will people seek in university in ten years? I guess it will be a success if 20% actually choose to capitalize on their talents. It means that a system for talent identification and development should be available at the pre-university stage to allow people to capitalize on their talents. The remaining 80%, if they all go to university, will still seek either brand, which is equivalent to social capital, or a set of high-paying competencies—with a tilt towards the scramble for brands, which has already manifested itself. The reason is simple: even today, we cannot predict the set of competencies that will become a market trend, and tomorrow looks even more uncertain. We can see this trend in leading universities and those of the cohort that follows. Even buying a degree is a particular case of the scramble for brands, brand standing not for a specific university but for the whole national system of higher education. That's how the dimension of credibility works. And people, indeed, behave rationally: an average employer who doesn't hire a WorldSkills champion draws on their own experience, which tells them that university graduates are normally better at grasping what you need from them, they normally learn faster, etc.

Could there be a different system of signals to replace the emasculated diploma of higher education? Yes, there could be, and we are

trying to create it right now. It will involve professional certificates and being listed on an open or proprietary database of people who have passed professional examinations of a certain level. However, because relevant industrial associations are invariably weaker than the university system in both institutional and economic aspects, I believe the trend is unlikely to change by 2025. Like Dmitry, I don't like this trend either, and I regret the need to say all these things.

As for manual labor, this is just a figure of speech. What I meant was procedure-based occupations. Yet, you still need a creative mind to execute procedures because you must know when to stop, you can't be a robot.

Now, as for what concerns the drivers and who can drive change inside university. Only 15% of HSE teaching faculty had publications in leading English-language journals seven years ago, whereas now the proportion has risen to 2/3. Some faculty members have left and been replaced by others, including our alumni and alumni of other universities, while others have changed since they saw strong incentives. I mean, we can't treat brownfield staff as dead-end employees, this is wrong and insulting. Strong stimuli, both positive and negative, must be provided to inspire voluntary change. Instead of growing greenfield inside brownfield, we should give everyone—every chair, every single staff member, every lab—a chance to change by demonstrating strong and hopefully persistent incentives. Two thirds of income at the HSE are paid for following those incentives. You follow them, and you change your behavior, and you join international teams, and you achieve results that are recognized by the global research community, not just by your department. Salary bonus criteria get stricter every few years. Such bonuses make up 2/3 of your salary, but they are permanent and non-subjective, you plan your efforts to get them. Incentive mechanisms don't run smooth in Russia yet. A faculty member whom we want to develop as a researcher should be given a five-, better ten-year perspective to understand the rules of the game and what exactly they should do to get access to a specific amount of funding. However, we keep changing the rules from year to year and awarding grants for 1–2–3 years only—the discussion of 3–5-year grants has barely begun in the Russian Science Foundation. This is ridiculous. Fundamental science doesn't work like that—even applied science can't.

How strong an additional impulse can be given by the spread of PDA regime and other preferential statuses? It would be great if an impulse was given to faculty, not administrators. If we launch the processes I was talking about, our next stage will be giving leading universities the status of “most-favored nations” in the economic world. The government will not lose anything in this scenario, but it's very likely to gain a lot. Thank you.

Arzhanova. Thank you. We now have 10–15 minutes to take some questions from the audience and respond to them.

Sergey Malinovsky, *Deputy Head of the Laboratory for University Development, Institute of Education, NRU HSE.* What will the university owe in 2030 or 2020, and whom to? You have offered a metaphor of university as a space of optional knowledge, optional student experience and optional communication. In this respect, my question is rather for Dmitry Peskov: to what extent is this space optional yet entitled to existence in your vision, in your university models? Each of the models you offered features a function of maximization. It seems like university dissolves in some corporate interests. However, student roles are what actually matters: to what extent will students in this new model be entitled to anything optional? Or will it be like in that joke about the rabbit that makes love without knowing it is bred for meat? I mean, to what extent may students—and not only students—engage in any optional activities? The flip side to this question is, can we think of the new functions and goals to assign to university? And shouldn't we somehow crack down on university owners to redirect their efforts into solving specific public problems? Because the suggested classification of university types is based on the functions assumed—these do this and those do that—but what problems they solve remains somehow left out.

Peskov. The question about the boundary between the obligatory and the optional is a good one, but you have answered it with your own metaphor about the rabbit. University's freedom of choice is limited by an array of functions, which, however, is so wide as to allow universities to create new worlds. This way, this is an obligation, but an obligation of a creator who undertakes to create at least a masterpiece, preferably a project, and ideally a setting as a result of university activities. Should purely optional universities exist? I strongly believe that any wealthy society can afford them. The question is, whether they will appear within the 20 years to come and whether we can place undershaped talents into optional communication environments. I don't know.

Arzhanova. Optional communication may involve other, less favorable areas. Maybe we should be talking about risk minimization here? In the end, not all the communities are creative and developing.

Peskov. Of course, you are right. Making allowance for these circumstances is what strengthens the boundaries of obligation in terms of functions and objectives that the government expects university to achieve. However, I don't see goal as a wall. Goals guide us, and *serendipity* is the key word in terms of organization of university interaction space. Serendipity management is what our universities lack and

what we have been investing in lately. It is literacy in serendipity construction and management that generates innovations. Innovations cannot be produced to satisfy an order.

Arzhanova. To me, it sounds very much like anarchy, controlled anarchy.

Peskov. The future is born out of chaos, not order—there is no doubt about it.

Kuzminov. In fact, the question about university's new functions and goals has to do with new, or rather additional university owners. This is an interesting question, but there are both a good answer and a bad one to it. The good answer is, students and alumni—the so-called “progressive” students employed in university-associated businesses and social projects—must be owners to a greater extent. Such an expansion of the circle of university owners would be an obvious advantage.

Another positive cohort of new owners embraces international researchers working in related fields. In theory, university must be governed by people at the forefront of science this university engages in—naturally, not all of them work in Russia. To the extent so as not to interfere with national geopolitical interests—as there are national security interests and other boring and unpleasant things—we must expand the circle of university owners, i. e. decision makers who treat university as their home, by attracting such global experts collaborating with university researchers. They must care. We have actually embarked upon this journey in HSE, Tomsk University and ITMO, inviting a number of foreign colleagues to engage in university development.

The bad answer is businesses that sponsor universities. Why are they bad owners? Because businesses often understand the universities they support in a very single-sided way or fail to understand them at all. In the end, a university owner is supposed to set goals and assess the processes using the power of its opinion. An owner must love the university.

Businesses accountable for supporting universities refuse adamantly from taking any part in governance, seeing invested funds as trust-based endowments. They will express their opinion but will never insist out of fear of being reputed as amateurs. That's how the HSE Board of Trustees operates.

Peskov. That is, money must be cleared of business influence. I agree with this approach.

Igor Chirikov, *Director of the Centre of Sociology of Higher Education, Institute of Education, NRU HSE.* Thank you so much for both variants, both are pretty viable and promising, no matter what. My

question is this: you discussed universities as very autonomous players, but they often lack autonomy, especially in the case of state universities, loved most of all by their founders. So, what will be the role of the Ministry of Education and Science in 2035 and how do you imagine the ministry or whatever will replace it in the future? What is the regulator's role in both versions of future university? What should it be like, what functions should it fulfill, and what will its relationship with university be like?

Kuzminov. I think its role will be considerably less important than today. The more independent and competent universities grow, the less external regulation and management they need. I can imagine more or less clearly what functions should be delegated to university associations. I think that government and public regulation must give way to purely public regulation—this is the case in most countries, and no one has died from it. The ministry should design strategies and elaborate some general regulations to prevent misuse of university potential. I hope it will never be responsible for determining the majors to teach. If you have to tell a university what to teach, that will be a bad university.

The government rarely has a clear vision of what exactly the education system should provide in terms of majors and occupations. The current situation, where student enrollment targets for engineers, technologists and teachers invariably exceed effective demand year after year, is an embarrassing signal that the existing mechanism does not work. As a result, candidates do not believe in job prospects in these majors, many strong secondary graduates refuse these careers, and government-funded spots are filled with weak, unmotivated students.

The government has effective leverages in the market of higher education in the form of grants for high-performing students in “trending” majors. A number of governors already use this mechanism by granting long-term subsidies for top-priority majors, which include investments in research teams and equipment. In this case, students will come themselves. But prescribing exactly how many students should be enrolled in each major is “accountant’s romanticism”.

Peskov. In an ideal spherical world that develops a digital economy, the ministry would be replaced by a service. Every time there is an intermediary that could be replaced by programmed or human self-regulation, it should be replaced. I agree that some functions will go. When we talk about 2035, we actually mean a much earlier date. This is typical of human ways of thinking: we can't think 20 years from now, so we think for the next half a decade but keep saying it will happen in 20 years—just to avoid the responsibility. I would say it would be wise for Russia to align the goals of education with the economic goals as much as possible. In this regard, the model “education + science” is not quite effective. Let's take a look at the experience of oth-

er countries, which have shown the best performance in creating relatively pre-designed new industries and developing economic efficiency. First of all, I would mention the British model and their set of functions, featuring the Department for Business, Innovation and Skills (BIS). The link is made here with a very simple logic in mind: there are pervasive skills, which generate breakthroughs and innovations that later form new industries and growing businesses that the country needs. I would separate this function from the special function of regulating the optional. Following the logic of Yaroslav, regulation of the optional can perfectly exist separately from regulating the efficient. We should discriminate between these two functions. I'm not sure how exactly it could be done, but I'm sure the ministry of 2035 will be a service, not a regulator.

Arzhanova. Thank you. Our time is almost up. I guess we didn't succeed in painting the picture of 2030 or 2060 so as to actually see what university will look like and where we will come. Well, that was quite unrealistic. However, we have seen different versions of trajectories that higher education in Russia and all over the world can move along, whether straight or branching away. I'm absolutely sure that we haven't touched upon some crucial and very interesting aspects, like what those branch points could be like, what lies behind refusing selected and objective lines of development, whom these deviations are contingent on, as well as rollbacks and inability to move forward. That is a separate subject for discussion that may be continued. So, now I've got one short question to both discussants: how interesting and useful did you find today's format? I think this discussion could also be interesting and useful for a much broader audience, and maybe it makes sense to continue it in another format.

Peskov. I would certainly continue, maybe after modifying the audience and format a little bit. For example, I believe it would be very useful to initiate a similar dialogue with the financial expert of the rector school. Promising students and prospective rectors could also participate in a discussion of this type. However, it's not the same questions that the conversation should be built around but the same sore points of people accountable for doing their work within the existing system. In the end, our worldviews are not comprehensive, being largely inflicted by the elite status within the education system or outside of it.

Kuzminov. I think it was an interesting discussion, and I have picked up some ideas from what Dmitry was talking about. I guess the discussion would have won if we had spoken more briefly, but this is all too subjective. I agree that it does make sense to further discuss the subject with more participants and for a broader audience.

The Book that Every School Needs

Review of the Russian Edition of the Book: Leontiev A. Pedagogy of Common Sense. Selected Works on Philosophy of Education and Educational Psychology

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Abstract The ideas gathered in the book should be of interest to every school that intends to implement the National Learning Standard. These ideas have to do with personal development of children, getting children prepared for further development, inculcation of cognitive competencies, collective learning, learning content as a perspective of the world, and the need for radical change in teaching foreign languages in school.

Keywords school, federal state educational standards, pedagogical psychology, personal development, cognitive skills, foreign languages.

How to Avoid Predicaments in Human Improvement
Review of the Russian Edition of the Book: Cohen D. K.
Teaching and Its Predicaments

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Abstract An answer is sought for the question as to why the United States remain the most attractive place in the world to get tertiary education despite its permanent secondary school crisis, based on what David Cohen reveals about U.S. education as well as what he would probably prefer not to disclose but which becomes obvious from his book. The U.S. tertiary education system makes good use of the best outcomes of secondary education from all over the world to develop the most advanced forms of higher education. Their education system rests on a self-organizing social environment, which has been great at adjusting to changing global trends. The attitude towards education as a constantly renewing process of criticizing the foundations and traditions of teaching is a key element of the worldwide influence of American universities. The article is focused on describing the mechanisms of adjusting the social environment through the development of outstripping forms of educational institutions and projects.

Keywords teaching, teaching as a profession, teacher-student relationships, professional expertise, job burnout, education reforms, educational trajectories.

How and Why Entrepreneurship Should Be Taught to Students: Polemical Notes

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Abstract In the paper, some social, academic and organizational aspects of entrepreneurship education in Russian universities are analyzed from a polemical perspective. The author argues that some widespread approaches of entrepreneurship education in Russian colleges are either less efficient or do not fit, and delivers a concept and structure of an all-university three-level elective course in innovative entrepreneurship, which could be implemented in some leading universities as a minor in entrepreneurship to support students when developing or enhancing the key entrepreneurial competencies. Major limitations (risks) and opportunities (chances) of universities willing to implement this teaching module are described.

Keywords higher education, entrepreneurship, entrepreneurial universities, entrepreneurial competencies.

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