

# Online Learning: How It Affects the University Structure and Economics

**Yaroslav Kuzminov—Martin Carnoy panel discussion**

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A panel discussion on online learning was held at National Research University—Higher School of Economics on June 16, 2015. Three main topical units were the focus of the opponents: how online learning affects the education structure; incurred changes to tuition fees and cash flows; promising areas of online learning research. Particularly, the agenda embraced the following questions:

- How efficient is online learning?
- What benefits does it provide to its players (institution, teachers, and students)?
- What risks are there for online learning players (institution, students)?
- Who has a demand for online learning?
- How does distribution of online learning affect the global and national ed-

ucation systems and organization of universities?

- Is it possible to replace regular courses with massive open online courses (MOOCs)? If yes, how will it affect professors?
- Can the MOOC phenomenon give rise to discrimination between massive online and elite classroom education?
- How do MOOC change the education market? Is MOOC distribution increasing the international competition between universities?
- How will tuition fees be affected?

**Keywords:** higher education, online learning, national education systems, international competition, elite education, MOOC, teaching load, tuition fees in higher education.

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**Frumin I.** The idea of this discussion was born in the April conference, when Yaroslav Kuzminov and Martin Carnoy gave opposite points of view on the prospects of online learning in higher education. What we would like is to start discussions in the format of debates between two (or more, if needed) public intellectuals regarding an important educational issue. If it works out, we will keep holding panel discussions for the journal.

Today, the debate is between Martin Carnoy, professor of Stanford University and Higher School of Economics, and Yaroslav Kuzminov, rector of HSE. The general subject is how the structure and economics of tertiary education are changing in the context of the “online learning revolution”. So, the first question is, how does online learning change the structure of education? Is it going to replace the tra-

ditional courses? Or will online courses retain the function of learning guides, i. e. supplementary materials to the conventional offline education?

**Carnoy M.** I think when assessing the role of ICT, we should first of all discuss the nature of the output of university. It is important to understand that the products that universities are producing remain the same if we use ICT for teaching. There's no question that you can use ICT for teaching and learning—it's been done all over the world. The question is, can we maintain the same quality of the output? Another thing is, if we want to maintain quality of such kind of teaching, can we be sure that online learning will save money? And if it does, in what way does it save money, what are the business models to make economy more efficient? So, we get to the question of whether this new business model actually changes the structure of the university.

For the moment being, the use of ICT the way we've seen it in terms of changing the sort of the structure of the production has mainly been in business, not in education. It is very interesting to see what kind of structure changes associated with ICT introduction occur to the business, to the production of goods and services outside of education, even outside health services. The main changes have occurred because of the information gathering capability of computer and the cardinal reconstruction of the communication and network system. Certainly in terms of storing enormous amounts of information and speeding up the access to this information, the computer has completely changed the way business is done. The communication aspect of business has also been changed dramatically by the computer. You can communicate with people if they are online—wherever they are: space and time just disappear in terms of communication. So, you can really speed up business processes. Thus, the structure of work has changed enormously, because the way people relate to each other has changed completely, the way information is gathered and used has changed in many ways. And this is where a big efficiency is. Interestingly enough, this is not the way it used to be—we're not even discussing this today.

I really think we have to distinct between MOOCs and online courses by universities. The president of my university said the following: "There are only two problems with MOOCs: mass and open." A university cannot run by advertizing MOOCs. MOOCs are basically open to everybody—they might charge something in future, but it's very hard to get people to pay. And, secondly, it's very attractive, but no good university is going to advertize it. Even Phoenix University—they don't use it, because, first of all, they have to have people finishing the courses that they pay for and they have to deliver degrees—people have to get degrees. This isn't a perspective with MOOCs. MOOCs are just a narcissistic way for universities and

professors to advertize themselves, to show to the public that they can offer some quality education.

**Kuzminov Y.** When we talk about online education, we must understand there are three tiers in online learning. First of all, electronic resources and e-libraries—this is one of the components of online learning that expands the potential of every library and every university. I do believe that virtually every university already has it at its disposal—paper books were replaced with e-resources very fast, let alone paper journals. Online resources of the first tier provide a dramatic increase in quality of education for those who read scientific literature or prepare their qualifying paper. Now they have access to virtually the whole body of modern scientific knowledge. This has put an end to the “provincial syndrome”: if you are a capable student or an expert teacher, you can get any information you need, whether you’re in Harvard or in a hick town, but again—only if you are a capable, highly self-motivated student, which doesn’t happen too often.

The second tier is online organization of the learning process. Most universities implement to some extent systems for educational process organization that save time and enhance opportunities of searching and signing up for various courses, submitting and returning homework assignments and tests. Learning management systems increase efficiency of time use for both students and professors, leaving the structure of education unchanged.

When we talk about e-learning, we must distinguish clearly between these two basic tiers and the third one—online courses with a built-in control system.

In their turn, online courses have three levels, too. The first-level course is just a “distant” live course given in one place and taken in another. Online live courses provide a unique possibility to reach students in remote corners and provide a wider public with precious teaching resources, i. e. the most valuable professors. The cost of registration of ownership and contracts for these courses is always disproportionately higher than possible profit, so online live courses are usually practiced within one university or among few cooperating universities without any registration.

The second and third levels are represented by prerecorded online courses for multiple use, which normally include a specific participant control or self-control system. Such courses have elements of staging, often information graphics or animation, i. e. mechanisms improving the transfer of knowledge. The courses may be publicly available or restricted to a limited number of users. Let’s refer to them as MOOCs (massive open online courses) and MCOCs (massive closed online courses), respectively. Martin has just called MCOCs online courses of a university, which seems a little bit imprecise to me as MOOCs belong to specific universities, too. It would be more accurate to define MCOCs as online courses *within* a university.

What peculiarities do these courses have? They resemble textbooks to some extent: the author may be in another place or even have passed away already. Students learn by using the product of the lecturer and of the whole course team.

A special case is hands-on courses and simulators creating a production task environment which is as close to reality as possible. In hands-on courses, the professor is out of vision. Simulation courses were the first to appear even before the information revolution. Using a simulator turned out to be much less expensive than practicing on real equipment in such industries as operation of aircrafts or other sophisticated systems. Simulators have lately won new niches, up to car driving and investment decision making. Software complexes make it possible to simulate ever more complex environments, and the price of their production is only decreasing.

If we go back to regular online courses, where the professor is on the screen, being the central figure of the learning process, the presentation methods can differ a lot. The simplest format is recorded lectures, the most advanced one is films where the “talking head” doesn’t play the most important role. Animation, videos from documentaries and interviews are only some examples of online course methodical techniques which were actually known to education before—we all watched educational films at primary school.

So, online courses are not a new phenomenon but a recombination of old components. New reality is provided by other factors: *the new level of accessibility* through the Internet and *the new needs* of students, or not-yet-students, or not-students-anymore, i. e. people with higher education, and universities, of course.

MCOCs are interesting because they allow us to see the limits of how the established university system is adjusting to the sharp increase in demand for higher education. Which universities do stake on MCOCs? Obviously, the ones that have numerous remote branches. Massive application of online courses changes the university structure dramatically. Let’s see: the central professor campus focuses mainly on creating and maintaining online courses, often to the detriment of offline teaching. So, the central campus turns into a methodology center, the center of MCOCs. Meanwhile, provincial branches of distributed universities replace professors with assistants who don’t give lectures but provide follow-up seminars and consulting instead. Clearly, expertise level requirements are lower for these assistants than for traditional professors.

All of this makes it possible to adjust to the boosting demand for higher education even with fewer skilled teachers than was required before.

Why do I, unlike Martin, vote for MOOCs and not MCOCs to be the key to the new era in education? Because MCOCs use the existing structure of higher education whereas MOOCs have the potential to break this structure. MCOCs fit in the traditional econom-

ic relationships while MOOCs are able to create fundamentally new ones. MOOCs remain courses for university students but half of the MOOC audience comes from outside the student body.

The MOOCs can be started in two different ways in practice. We can talk about independent study of MOOCs and I know there are several people here in this room who have been doing that. Normally these are capable students who would like to get an alternative perspective of the subject they are studying or would like to have a clearer explanation of what they didn't understand in a lecture. Alternatively, people sometimes obtain the so-called "dissipated learning", which is an unstructured learning process that you choose for yourself. The potential of this sort of education has expanded enormously as MOOCs emerged.

I would like to say that I quite agree with Martin that the structure of education has not changed radically and the incentives for the parties in the education process are the same. These incentives are based on the original needs, general culture and orientation towards vocational pursuit, certain careers. Consequently, we have strong and weak students, better and worse students, and there are also different types of professors. These categories of students, professors and universities remain, nothing has changed even with the introduction of MOOCs which have already involved 15 million people—about 10% of all students in the world. The basic education structure originates from these incentives and from the relevant qualification. It cannot be changed by tools such as MOOCs.

What has changed is the organization of resources and the structure of learning courses that exists today in the market. The array of such courses is expanding, there is a much better chance to compare good and bad courses or educators now, and of course, there is more ways to increase the load on the curriculum through the independent choice of a student. The extent to which students use this opportunity depends on their motivation only.

Another major change is that MOOCs extend tremendously the windows of opportunity that higher education provides to adults, to working professionals who find it difficult to interrupt their careers for another degree or just further learning. The life span of an average production technology or even profession has shrunk as compared to the period of working life, so the motivation to continue learning at the age of 25–45 is a lot higher today than 30 years ago.

There are other innovations, too. Learning courses lose their absolute connection to the department and university. You can take a course delivered by a Harvard or HSE professor irrespective of the place you study at. But what is the attitude of the organizing universities to such processes? Martin just said that no solid university would accept such online courses as credits. We may not be a solid university yet but we're going to run the risk of giving credits for online courses.

es approved by a special academic council committee. Which tendency will win? I believe it will be the one towards openness.

It's easy to imagine that universities may not count the credits received for online courses. They may provide no support at all to this trend. The stronger the university and the better its reputation, the easier it can deal with the problem. In fact, this is very similar to the question whether or not to prohibit reading of printed books in the 14th or 15th century. It would seem strange for us now but there really was a choice between handwriting and typewriting; it would seem strange but it was highly appreciated when the book you were reading had been rewritten by a knowledgeable and educated person. I think today the opponents of wide application of online, or open, courses just associate them with a poor level of education. Indeed, we have a very good professor around, so why would you bring us credits for a third-party course? But the problem is that general public around us may not recognize we are right. It's possible that we are mistaken in believing we are good and strong. I think this romantic defense that you can find in the existing education system will last for about five years more. I hope to live to see that happen, I hope everyone here will. And we'll be able to have another round of this seminar to discuss the same thing.

What can MOOCs give at university or at high school, wherever students are allowed to choose?

For students, it's the broader choice, going beyond the possibilities provided by one university. This "broadening" is not only quantitative: with MOOCs, you can easily try course after course until you find what you really need or understand. This effect cannot be achieved in offline or even online courses embedded rigorously in the obligatory program, which is often the case with distributed universities. An additional benefit is that you can use MOOCs or their elements as a coach or as an auxiliary learning guide for your offline studies. This is how many HSE students are using MOOCs right now.

For universities and the faculty, it's the possibility of giving very narrow, niche courses that offline universities have to abandon now because they just don't have the resources, because only one or two students apply to take such courses. EU universities are optimizing their resources now, eliminating positions of professors in Finnish or history of Hittites. Any offline university will have to drop such courses and sadly say goodbye to experts in classical philology, history of Byzantium, or petrography, you name it. In order to bring people together in an audience large enough to justify having one professor for that, you need to apply huge efforts, because you need to do more, you need to persuade people to come and convene around the professor. Online courses give you the real opportunity to justify niche courses and provide the full diversity of knowledge that we offer in education. It could be only two people from one university, three from another and so on, and then we can easily say we have an audi-

ence to keep our professor in petrography employed. What I'm talking about is the potential opportunity—as we need to develop a new economic model for that, and we will discuss it later today. A university should be able not only to gather an audience for a narrow expert but also to find resources to pay this expert.

What is being lost in online education and what should a regular university try to make up for? First of all, peer effects will be lost. Peer effects, or student milieu effects, the quality of this milieu are as important factors of successful learning as good professors or high motivation for learning. As you're sitting at your computer, you're sitting there all by yourself. We have seen very clearly the sad consequences of conventional distant learning, the poor quality of education demonstrated by such graduates. That's why universities with self-respect should not just drop courses for which they don't have a competitive professor and make them online, they will have to provide a team of assistants who will discuss topics at final seminars, do projects, and perform 30–25% of the workload that any regular university takes on in offline courses. In other words, dropping courses completely is no option, as it will highlight the gap between strong and weak universities. A weak university will never have the resources or faculty to maintain and interconnect online courses, so it can only develop to become a station granting diplomas for third-party courses. This sort of modular structure, where Bachelor's or Master's degrees are built from courses taken in different universities, has been under discussion for quite a while in the teaching community. Finally, what will also be lost is informal after-class discussions, which form the basis of academic environment in high school or university alike. Yet, again, that's the problem of strong universities and strong high schools. It's inapplicable to weak institutions because their educators are not interested in a dialogue and students will shoot spitballs at them rather than listen to what they have to say.

**Frumin I.** I think we see the discussion evolving, we see a proposed classification of change factors at the level of specific universities, and we see some well-structured ideas of transformations. Let me remind you the original question from Martin: why in education, at least so far, it has been the case that the application of ICT has not resulted in radically increased productivity of labor and dying out of certain positions? Except for libraries where at least something happened indeed, which was mentioned by Yaroslav. I would like you now to go back to the structure: how do you think the structure of global and national education systems will change?

**Carnoy M.** Online courses exist just about everywhere. So, we're not talking about something hypothetical, we're talking about what really exists; and there are various levels of online courses: some online portions of existing offline courses or regular online courses that

are completely virtual. The Open University in Catalonia has 60,000 students. They never meet in the class. And Phoenix University in the United States has 300,000 students, of which probably 80% now are just online and they pay pretty big money to attend these courses. They pay about as much as they would pay to a regular second-tier private university. And we have a lot of data about the participation in these courses and how students participate... So, let me say this: Yaroslav is completely correct. If you want to run an online course, you should understand that MOOC is not an online course. I must really separate this idea. None of these universities have MOOCs. They just don't do it. They don't do it because nobody is going to pay for it. That's the problem. When a great professor, great university is going to give access to the lectures to students as if it were a book, a set of lectures, this is perfect. This is good. It is like a book. I can get the book in the library and I can get lectures by the professor. That's fine. So, it's an online resource. But it's not a course. Why don't we just give people textbooks and say, "Go read the textbooks and I will give you an exam at the end and see how much you learnt in the textbook." Have you heard of such courses? I've never had. So, MOOC is a textbook basically. It's the curriculum, it's a textbook, it's a reference. Okay, it's nice to hear the professor and it's a valuable resource, but it is not called a university course. University course has a structure and MOOC can have a structure, but it has to have feedback, it has to have interaction. There are tests and homework associated with MOOCs but there are no teachers. There's nobody grading—it's all students grading each other. No feedback except from other students. No university is going to do that.

However, let's talk about online course and what it means for the structure of the university system. Do you think that the second-tier universities simply say, "Oh, since we have very few students in some specialized subject, we're going to let better professors from Harvard teach that course to everyone. And we're going to fire all the other professors that do that course." Do you think it's real? US second-tier universities have tried to do a statistics online course that is now open for everyone. The students did worse in that course than they did it in the face-to-face course, considerably worse at the exam. There was a lot of resistance to that course and as soon as the students did worse, it was over. It was finished. Why? Because the other professors didn't want it.

Just because a professor knows the subject very well and knows how to present lectures, it doesn't mean that they are going to be a good teacher or that you can teach them how to teach. It assumes that a person at another university that does the same kind of thing may be a much better teacher. So, professors at other universities argue, "We teach this just as well as you teach!", so then it's a zero sum game. One university is going to get the professor and other universities are also interested in organizing the course. So, you set up an



immediate system where there's conflict and it means resistance. It means there's going to be winners and losers in that system.

The other aspect of introducing online courses into the university structure is that they require a lot of labor, much more labor than regular courses, because you need people to interact with students. The advantage of such teaching staff is that they might get better attention, since they can communicate right away with students. That's supposed to make learning better. However, the data suggests that the learning does not improve; it doesn't get worse though either. If Phoenix University gave us data, we could understand how it works. But of course, it's a private university, so they're not going to give us data.

We must remember that such courses are taken by 30-year-olds, people who have jobs. And this is the terrific advantage of the course. I'm not guessing this. We did a study in Open University in Catalonia, and we found that the average age of people taking these courses was 29 years old. Same thing in the Open University in England. They're older and many of them already have very good jobs with high salaries. Many of them don't have the degrees necessary to keep their salary, so they take these courses. By the way, Phoenix University and the Bryant University have hundreds of thousands of students because they're private universities in the United States. The average age is 30 years old.

So, this is the target audience that really profits from taking these courses because they can keep their jobs and do the courses they like and do it at their own pace. Many of them studied at universities and may actually have even taken these courses. They take them now again because they either need to learn something new or they want to get a higher degree so that they can get promoted in their work. I don't think you can use the same criteria in terms of these courses as you do with undergraduate level. Test scores are generally lower but they have more discipline. And the discipline is more important in online courses—you need a lot of it to come home at night and work on your course. That's why to me, MOOC is not a way to go with online courses. Targeted online courses should be developed for this specific audience. That's where the success is. And if I were to advise a university that wants to go into the online business, that's the way to do it. However, they're not going to have the same level of quality of the students as at the regular courses in good universities. On the average, the people outside are not going to be as good, the grades are going to be lower in courses, the dropout rates will be growing—everything is going to be not as good as in regular universities. However, it's a wonderful service to provide to community. It's a wonderful service to provide, particularly, for learning new things, getting new degrees, re-learning. The finishing rate, of course, will be very low in these courses, you should be ready for that. So, these are the biggest structure changes.

**Kuzminov Y.** I will try to argue some points offered by Martin. I believe that in certain cases you have sort of an idealistic view of offline courses. Talking about offline courses, we anticipate there will be an interested audience, professors ensuring feedback to most students and willing to stay after classes. This is, say the least, far from reality not only in Russian provinces, but also, say, in French universities—not grandes écoles but massive universities enrolling everyone who brings in their *bacs*. A huge number of examples may be found in universities of developing countries. Perhaps, US universities make a league of their own with their amplest resources and best professors and methodological researchers in the world. I have no reason to distrust Martin but I insist that most universities in the world are bad in teaching their offline courses, i. e. they just don't yield the positive effect that we envisage ideally.

There is a number of problems with offline courses that have been offered by universities and included in their own or state-dictated curricula. First of all, half of Russia's higher education is distance education through the so-called "correspondence points" in small towns and villages. They have no courses in offline mode, so there's nothing to replace.

Second, some professionally demanded courses just don't exist. They just don't have adequate professors for that. This situation is quite realistic for half of tertiary education in Russia. What universities usually do is they either simply cheat or try to enter into a tacit agreement with students, where both parties agree that the entire curriculum has been covered—but it actually hasn't. A few years ago, 90% of Economics departments in Russia didn't teach econometrics or economics of the public sector. I strongly doubt this is a unique feature of the Russian Federation alone.

Third, very weak professors. The situation, again, is more than realistic for underdeveloped countries. Professors who don't have at least Master's level knowledge of their own subject are not ubiquitous but they account for 10–20% of faculties. A great proportion of professors don't do any research, i. e. in fact they have no right to teach at universities—this is about one third to one half of all professors in post-Soviet and developing countries.

Well, these are the "scary things". Let's talk about the non-scary and the more trivial ones. If we have a good university and a decent professor, how many students do you think will listen to lectures attentively? You're lucky if half of the students are focused on the course that they attend—I'm stressing this—they're not playing truant but they are just busy thinking of something else. Yes, it's true, universities are trying to fight against this noninvolvement and the lack of contact. First of all, they organize written tests, which is a built-in control system. However, online courses also feature such systems. Even such nonobligatory platforms as Coursera use quite a lot of this

type of control—not only self-control, by the way. So, I'm not really getting the difference here.

In the meantime, I totally agree with what Martin has just said—it's true, this is an offer for 30-year-olds. We have our colleague Yevgeniya Kulik here, who is in charge of our work on MOOC and who can confirm that at least half of MOOC participants are people who already have higher education, i. e. the 30-year-olds. And that's what gives us a chance to complete the education system in the format that is needed by our society. This is the kind of offer that will cover the real demand that the traditional education system fails to cover or only covers in niche, elite business schools.

Apart from that, online courses can perform the function of standard setting better than any other tools. Standards need to be set in the best part of tertiary education and high schools, not only for teachers, but also for students to be able to determine whether a certain professor is adequate in a certain offline program. This is a huge issue in Russia. The standard setting function is highly important for education systems with changing curricula, which is true for the majority of systems today, and I don't think they are going to freeze in 10 or 15 years.

**Barinov S.** (*Institute of Education, NRU HSE*). Well, I'm in the field Yaroslav called high schools, so I apologize if my question seems a bit naive to my colleagues. The thing is, the discussion on interaction between offline and online education reminds me of the discussion on interaction between social networks and offline communication. We're lucky enough that the revolution of social networks happened ten years before the revolution of online learning. However, I think the universities are underrepresented in social networks. So, the question to the discussion participants is, do you believe the peer effect issue mentioned by Yaroslav enhances the actual abilities of social networks in this area, including replacement of offline peer effects with online ones? Or maybe interaction in social networks has already shrunk to exchange of notes between students and we need to find some other formats?

**Carnoy M.** About seven or eight people in Stanford are studying the nature of peer interactions between students taking the courses. They get the data from the Bryant University, one of the biggest private universities in the US, and they analyze email correspondence among students. There's also some other literature developing on peer effects in these online courses. One of my students does this and he sent me his work and it surprised me. What surprised me was, first of all, that an average amount of interactions between these students was once every several days. It's not like we do email, is it? Meanwhile, these are online courses which are not open. So, they interact every few days and they do change opinions about the courses.

So, there's a lot of empirical literature on what is similar and different in having face-to-face or online interactions with other students. It turns out that students in online courses never have to talk to anybody, they just text people. They never have a real conversation, yet it's absolutely possible. I guess Yaroslav is right and we shouldn't assume some idealistic view of offline, face-to-face learning, where students come and talk and I come to class, too. If a university doesn't use computers to check whether students are coming to class or not, many of them just skip the classes. I take a Russian course in Stanford, and if a student doesn't show up three times in 10 weeks, they lose one grade. If they miss three more, they lose another. Stanford students do not like to get C's, they like A's. So, they show up at almost every class unless they're really sick.

Now, big classes-300 students in the course. Of course, nobody knows if they're in class or not, they're probably doing online shopping during the lecture. But when they come to the section with the teaching assistant, they have to appear and participate. Clearly, if you can control attendance in online courses, you can control attendance in offline courses, too. Yes, I agree with you, it's stupid to talk about some idealistic view on offline courses or online universities. When I was teaching in France, there were 120 people in class but in the lecture I've never seen more than 80 at the time. Well, I wasn't taking attendance but I can tell you right now that those 40 who didn't come to class—almost all of them failed the course. It's very hard to pass the course if you don't come to the course, if you don't get reading materials... So, I agree, we shouldn't make universities sound like some idealistic place; instead, we should control whether people are attending or not, whether it be offline or online courses.

**Vasilyev K.** (*World Bank*). The structure will change in response to an outside demand that the existing structures are unable to meet. The outside demand from students has been clearly formulated in the discussion. People who are short on time will opt for online courses. People who are short on money will choose free-of-charge online learning. People who lack access to high-quality offline education will also go online. Do you see any demands or shortages from the labor market rather than students? Do employers have any demands to the tertiary education system that the current system is unable to meet? Any demands to skills or competencies or the organization of the learning process? Is there an unmet demand in the current system that a new system or a new structure would be able to meet?

**Kuzminov Y.** I don't think online courses can meet the demand for competences that are relevant for your CV but have not yet been included in the curriculum, or are being introduced, i. e. do not belong to the academic tradition. This is the mission of offline courses, first of all because these competences are mostly of applied type. Do

you know where online courses are inapplicable at all? At the second, practical stage of medical or engineering education, where you have to do something with your own hands working in a team. These “edge competencies” are what your question relates to. In other words, these are conditions created by the labor market: for instance, if you are knowledgeable in graphic design, you can make a good career. Most often, the demand for such competencies will be satisfied by learning centers established by owners of relevant technologies, i. e. corporations or people from these corporations who started their own business. So, my answer is still no. Maybe Martin thinks differently.

**Carnoy M.** I trained as an electrical engineer but I haven’t worked in this field. Initially, I went to look for jobs as an electrical engineer. The only thing that they were interested in was my ability to solve differential equations—how quickly I could solve nonlinear diffy-q’s. They thought it was a very valuable skill. So, that was it. And then I said to myself, “They don’t even care if I can fix a radio, they only care if I can solve some math.” And I gave up the career of an electrical engineer.

In Russia today the number of jobs available for engineers may have increased a little bit lately, but it’s definitely a profession that declined in terms of demand. However, the engineer degree still has a higher rate of return than anything but a business degree. Why is that? Because general skills—what is engineers’ general skill? The ability to do math. That’s a signal your diploma sends to the potential employer. If you get an engineer degree, you can work in finance. You’re even likely to know math better as an engineer than as an economist.

So, the students of good universities or online courses get more money. It’s not because they have learnt some specific skills, but they’ve been selected into these universities, so they’re already smarter. And that’s the signal to the employer: if you got into HSE, it means you’ve been selected to HSE, so your test scores are higher, so you’re smarter. And then, the second thing is that you have probably been competing with other smart students and so, you have a higher level of general skills. I believe that online courses are very good for teaching very specific skills for very specific jobs. The educational television contributed to that. If you want to teach a worker how to operate a machine, there’s nothing better than to have educational television to teach them—some kind of a video which teaches how to do it. We have now online courses for teachers how to become better teachers at mathematics, 10 lectures, but they’re very specific. You’re already a teacher, how to become better at teaching math or other things that you do? As a teacher. I really believe in TOCs (targeted online courses) rather than MOOCs.

However, it’s very nice that some computer science professor has 160,000 students online doing computer science. And somewhere out there in India there’s some smart kid who studies in this course and finishes it. And you can say if it weren’t for that course, that In-

dian person would never have a chance to do this course. It's great! It's wonderful! But so what? A good advertisement for the course, but the fact is that out of 160,000 people 2,000 people finish the course. That's why I think—that's what I said in the beginning—you've got to divide between a much more idealistic view of online education, e. g. just some information available online, versus targeted online courses that target the specific audiences with very good curriculum that teaches them some specific things quite well.

**Kuzminov Y.** There was a very interesting thing that Martin said—something that is very often discussed and argued as a factor of inefficiency of online course. It's a very high dropout rate indeed—the dropout rate in online courses is huge. 90% is a norm and 80% is a great success. How should we treat that? I wouldn't look at that dropout rate as at the evidence of online courses being bad. That's just the evidence that they perform one more function—the function of searching for the right course, because if you study offline, you cannot visit 15 lecture rooms to try 15 different professors. But you can do this online. You choose 15 and you pick up just one. I'm not saying this is the only explanation. Of course, there is a high dropout rate just because online courses don't have enforcement mechanisms—there's no peer effect, no discipline management to punish for nonattendance, and these factors are important, too. However, we should not forget about the function of searching. Online courses help you implement the free search function and adjust yourself to whatever set of courses to find an optimal one for you.

Another very valuable thing that Martin said is that it's rather not the open, but targeted online courses created for specific target audiences that are going to win in future. I don't think they will actually win but their niche will certainly grow. What kind of niche this will be? It has existed for 50 years already—simulators, simulation software, I've mentioned those. We are used to using simulation software when we learn how to drive or fly an aircraft, where the equipment is too expensive to damage. However, as the simulators are getting less and less expensive and as the simulation software is becoming more and more effective, we're learning to visualize just about any changing reality or environment, whether it be an environment of a broker, a physician, or a teacher training student preparing to work at an elementary school for developmentally delayed children—all of these can be simulated. We have a huge amount of computer games where all of the technologies have been already created. This kind of simulation programs can be targeted with very limited access and they could be open as well, and there are many examples of that.

**Carnoy M.** What I'd like to add to what Yaroslav said is that searching for the course that you want to take, choosing from 15 courses is not a university program. Universities define what they believe you

should take in courses in order to get to degree, in order to develop the skills to say, “I am now skilled in this field.” So, we have to develop the entire curriculum in order to do that. And professors do it, universities do it, departments do it, they say, “This is what we believe a student must know to get an economist degree from our university.” And they say who’s going to teach this course, who’s going to teach that course, but there are required courses—probably 9 or 10 in every major—and there are elected courses.

And we are saying now, “We won’t do this. Let people search for courses themselves, let them decide what is best for them. Well, that’s not university degree anymore. It’s something else. That’s a big change in the structure of education. Basically, if you’re applying for an economics degree, you’re choosing who has the best teachers and who gives the best MOOCs. It’s possible to teach an online curriculum, to give lectures, to have good professors, but you must pass tests in order to get to the next course. You must finish that course to go to the next one. You must take a series of courses in order to get a degree. That’s what Phoenix university does, that’s what the Bryant University does. There are some courses that are required for every student. Even engineering students have to take some courses like “The History of Civilization”.

**Smirnova Z.** Now let’s talk economics of education. I suggest that we discuss what changes MOOCs bring to the financial flows and ownership relations within the university in the whole sector.

Ten years ago, universities competed for reputation only. Now, given the higher education massification, or even universalization in the developed countries, given the growing globalization and the possibility to select a place to study, and also given the price of education, there is also cost-based competition, because that’s what the pricing eventually depends on. It’s interesting to analyze the effects of the growing number of online courses in this aspect, as online and offline courses have different structures of costs. Online courses have very high fixed costs. They have to find equipment, location, camera operators, video editors and so on. Yet, their variable costs are approaching zero. It’s all vice versa with offline courses. As a rule, the university has had its premises since long ago and thus doesn’t have to invest much before actually launching a course, i. e. fixed costs are close to zero. Meanwhile, when the university has all of its lecture halls filled up, adding more students is virtually impossible and can only be done if huge investments are made in new buildings, i. e. variable costs are rather high.

Traditionally, economic models of universities were built around their education products being unique and non-reproducible. The emergence of online courses has thrown this seemingly unbreakable rule into question. For the first time ever, universities now have a chance to replicate their education products without losing their rep-

utation. There have already been some examples like this in creative industries, like book publishing or book production.

This way, universities find additional development strategies. They can restrict some basic courses or topics to MOOCs and thus let professors focus on research, which will contribute to the classroom discussion and to the university reputation. Basic courses should be taken by everyone who has them on their curriculum, it may be all the students from all the departments, because numbers do not matter. However, those who really want to get a deeper knowledge or even make a career in the field will have to go to seminars and workshops to discuss some advanced topics with professors. Thus, universities will be able to focus less on teaching as such and invest more effort in research. That's where we have to answer the question, whether such education program will ultimately save money or not? This is only one of the possible effects on the university economics. I suggest that we discuss other aspects, too.

**Kuzminov Y.** The economics is only incipient at this time. I feel it is just impossible to make any reasonable predictions about the impact the online revolution has on the university economics unless we remember there is another process evolving in parallel, the process of making ownership rights partially transferable. Not infrequently, exclusive ownership rights are not registered at all in the innovative economics. It may just turn out unprofitable: the cost of copyright management and protection exceeds the expected returns, as technologies keep replacing one another. However, you can create a profit flow just because you are the pioneer. As you become a brand, you are able to boost your sales, which is enough in most cases. Moreover, you are interested in being copied by as many people and businesses as possible, because you have a different income generation model now. Yet, you need to keep the leading position in order to succeed. If you stop being a leader in developing a model or technology, it means the market is shifting its focus to someone else, who may not be the author of the original idea. I think the revolution in ownership rights makes it possible to predict what the university economics will be like tomorrow. This economics is being shaped before our own eyes.

First of all, there are already online courses attended by 20 million students, who account for 20% of the entire number of students in the world. I think it's going to be 30 million students in a year. These courses have been provided by a limited number of universities that spent quite a deal of money on this. The Higher School of Economics is one of the major players in this sector in Russia, so we've had an experience of our own, which is \$30,000 to \$70,000 to launch and maintain a good online course.

What makes us go this length? What makes Harvard, Stanford, MIT go this length? First of all, it's a question of investing in the



reputation. When we offer online courses by our top professors, we're sending a signal: "Look at the high quality of teaching at this university!" And in the meantime, we are not replacing our education, we are just signaling that it's good. We're trying to involve as many people as possible, encourage them to take our offline learning programs, spark the interest in our research. Such behavior is absolutely rational. Therefore, we don't need to draw up a balance sheet for every single MOOC. The MOOCs will always be partly free of charge, because investing in one's reputation is crucial.

Second: what is MOOC? MOOC is not only a textbook. It's an interactive system with feedback and control mechanisms, operated by a permanent team. The university should have a team to maintain online courses. So, when it comes to financial planning, we should calculate the proportion of traditional offline course expenses that this team will take—that's the first step. And the second one is to determine how much the donor university will have to spend on the support to online communities involved in these online courses. We're only entering on this path but I can tell you that in our online courses with tens of thousands of participants and thousands of graduates, we've had a special team, and we've paid some money to them, and we can already feel the expenses.

Probably, the majority of national education systems can be balanced to provide a Pareto optimal distribution of costs and rewards among players. For instance, teaching one offline course costs \$10,000 monthly, of which \$8,000 is paid directly to professors and \$2,000 is associated costs: payments for the use of buildings and equipment, administrative support, etc. If we replace this offline course with MOOC, payments to "maintaining" teachers will make \$2,000 for the recipient university and \$1,000 for the donor university, plus a \$500 royalty for the author of the course. Associated costs will remain the same. So, we're going to save \$4,500, which is almost 50%.

If it's going to be a 50% saving, the recipient university will have a strong incentive to give up all the other formats of the courses where they have to pay salaries to teachers who don't have any academic reputation. By other formats, I mean situations where several teachers are giving the same (most often, basic) course to different cohorts of students. We're paying them, they're teaching our students, but many of them don't publish anything nor do they do any research. So, it would be better to dismiss such professors, keep young assistants on lower salaries, and invest the saved money in another professor who has publications, engages in research and contributes to the university reputation. So, following what Zhanna said, the mid-level universities that will have the resources to adapt positively to the system can really develop conditions to become more research-oriented. They're withdrawing resources from reproductive teaching and reallocate them to upper-division, Master's degree and research professors. So, the teaching-type universities have the chance to become

more research-oriented. And the third portion of such universities, those without any financial or staff resources to ensure positive adaptation, will either disappear or turn into the sort of diploma issuing stations, where people bring credits from third-party courses. Obviously, such “modular” MOOCs giving diplomas of third-tier universities clearly offer the worst type of education. You will be able to tell this because people won’t get the relevant ongoing support in the courses.

**Carnoy M.** Right now no university including Stanford is using MOOCs as a way to increase their reputation. You know, we have an academic market, we’re not Russia where most universities are financed from the central government. In the United States, there’s quite a market of universities. This market has not been willing to buy MOOCs from the great universities. I think University of Pennsylvania has created a bunch of stuff, the University of Illinois has created a bunch of MOOCs, in Stanford there has been Coursera and they have tried to do it, but the business model is very unclear. Very unclear. The argument is exactly this way: that lesser universities will purchase these MOOCs in order to upgrade or maintain the quality of their courses and save money. So, unless I miss something, there is still no clear MOOC system that would be widespread enough.

However, there’s a huge business in online courses—not MOOCs, online courses. Virtual universities are making lots of money offering most diverse courses.

What will happen to the cost of university? Why has the cost of university gone up? Is it because class sizes have gotten smaller? Or because professors are paid a lot more than they used to be? No. It has gone up because the administration has expanded. Relative to everything else, administration has grown enormously. It could be student services, it could be legal... in American universities the number of lawyers hired has gone up exponentially, because Americans sue each other and universities are worried about students suing universities. So, they hire a lot of lawyers. So, legal costs come up. And even though computers and ICT are used a lot in the university for management more and more directly, I don’t think they really changed the structure of the administration. Now, it is very hard to deliver student services, quality student services by computer. It really requires hiring more people, despite the use of computers.

You know, we can’t really talk about education using ICT to make universities more efficient. We only talk about the way businesses use it in order to save on labor. Basically that’s what we’re talking about, because in online courses the main way we save on labor is by subcontracting the cheaper labor to part-time workers. This is the main way to save. I’ve been working in this area for 7 years and it gave me all kinds of data about it. If there is a cost saving at all, it is because we’re subcontracting to other professors, other universities part-time to work with the students.

It's a real question to me whether we can really save money on it. From what I know from university in Catalonia, it's just as expensive as the Spanish university, regular Spanish university. There are, indeed, cost savings from online courses to individuals who are having this course, because they don't have to go to university, they can sit at home and do the course. And who takes these courses, on average? Is it 18-year-olds? No. It's 30-year-olds, as I said. So, answering the question, whether or not universities need online courses, I would say that there is an interesting business here with older people who work.

Anyway, the other question is how do you get those bad universities to pay for these courses? Well, they will pay for them—I think Yaroslav is right—they'll pay for them if they can fire a professor and pay for this course. And they may do that. And that will definitely change the whole university system. It will favor the rich universities with the good reputations, doing research. And it will disfavor other universities. So, the argument is that the students will benefit from this because they will receive better education and basically the whole system will save money.

They will save money and they will improve the quality of education. But it won't be done through MOOCs. It will be done through high-quality online courses offered by somebody—not necessarily HSE, but somebody will be in the business offering online courses, and HSE will subcontract their videotapes, for example. Maybe some special types of contracts will be introduced. Because I don't think HSE can maintain itself as a high-quality research university and at the same time be running an enormous business, which requires curriculum, quality courses, and monitoring who is taking these courses and what progress there is. It's like running a separate university, because it's a unique type of business, and virtual universities shouldn't ever try to be also high-quality research universities with graduate schools and PhDs.

Open University of Catalonia is trying to do that, but it's very expensive. They have 60,000 students and a huge number of professors doing research. I will not say their research is great, it's not considered one of the best universities in Spain, but it is done. A lot of the money is covered by the government. It's an interesting example, but it's not a high-quality university running an online business. I think they are really two different things. A virtual university is not a part of a high-quality research university.

So, to me it's the crucial issue. Can a good research university be at the same time running a business which is called virtual university? Stanford will just not do it. Columbia refuses to do that. HSE is sort of ready to offer degrees to those who learn outside of it. But university reputation depends on the quality of graduates of your online courses, and online courses tend to decrease the level of academic achievement. So, my suggestion is if you want to do this, run this as a separate business and subcontract.

**Kuzminov Y.** I would rather argue with almost everything Martin said in his final talk. First of all, concerning the fate of the weaker, second-tier universities and whether they will have to fire their faculty. Well, let's forget for a moment about the market in the United States. Those universities are well-funded indeed. They have existed for a century in the context of advanced scientific communities whose opinion they can use to select professors, and I trust Martin's opinion about what they're doing. It's very likely that most US universities have both financial and faculty resources to refuse for quite a long time from using costless and very cheap courses offered on the MOOC market. It's also likely that the universities in Western Europe and Japan will do the same.

However, the situation is totally different in the rest of the world. Demand for higher education has boosted to almost match the one in developed countries, while money and staff are insufficient to provide adequate higher education to everyone who wants it.

A very big proportion of universities even in Russia, Brazil and China apply some dishonest practices. They have to. They may not be willing to, but there's a high demand out there and they just don't have the human resources nor the money to do it right. So, for them that could be a wonderful way out. For the universities, let alone the students.

Situation number one, the simplest one: the universities that include a selection of MOOCs in their curriculum will not have to fire anyone. They will just stop searching for professors to teach those courses. Socially speaking, that transforms the problem: you won't have to fire anyone—there will be just no one to fire.

Situation number two: professors and courses of low quality will be forced out. The process will be regulated both from above and by active students who will use the MOOCs they're taking voluntarily to accuse weak professors of having little knowledge. It's a real-life situation, I've heard of it multiple times.

Professor resistance to changes is an interesting aspect per se. How far does this resistance go? How does it differ across different types of university? To me, "university democracy" is not typical of developing countries, where we expect MOOCs to bring the largest-scale changes.

Nevertheless, using MOOCs by the leading universities is possible, too. Could the leading universities themselves provide an example? Yes, they can. The economic department of HSE is considered the strongest in Russia. We absolutely could—I think the dean will give me his support—we could put the accounting courses online as third-party MOOCs. It happens so that we don't have a strong group of accounting teachers. Accounting is necessary, it's an essential course. But I don't think we should start a special group of professors here who would not be doing any research in accounting that we would be interested in. Or let's take the office software courses that we need badly. Of course, there are many people in the market who

could come up with a proposal to teach such courses. But it's not profitable to hire them because they won't do research, they would lower our standards. That's a reasonable outsourcing practice. I don't think at all that our overall quality will drop only because our students enroll to the Financial University virtually to take the accounting course.

There is a more complex issue—the economic strategy of the leading universities as producers and, most importantly, supporters of online courses. I think the leading universities have already been doing this. Let's take a look at the two leading platforms out there. The three leading universities—Stanford, Harvard and MIT—what else do they need? They have already made this choice, haven't they? Yes, the funding often comes from a third party, but, well, 50% of American university activities are funded by third parties. It doesn't make the university brand any worse. If you go to Coursera or edX website, the first thing you'll see there will be the Harvard or Stanford window, respectively. Another question is, to what extent they will be willing to pay for the programs, for the groups supporting younger lecturers? I don't think it's something new for them, for the simple reason that they have a huge number of postdocs around any good professor and a jillion of very good Master's students who will be happy to check homework the way they do it in Harvard. So, I don't see any troubles here. The leading universities have been doing this already—they are doing it right now!

And I would disagree with the argument that by producing MOOCs, by putting MOOCs into the market, we will offer HSE degrees. Of course, we won't! We have published a lot of textbooks, the Moscow State University has published a lot of textbooks under their imprint, these textbooks are being used by half of Russian and Ukrainian universities, and no one thinks it depreciates the value of HSE or MSU education. Same thing with MOOCs. We can fill a slot, we can put our brand on it, but that only means that someone has passed the Micro-2 course at the Higher School of Economics. That's it. End of story. Everything else has been passed elsewhere, and the diploma was issued by a different university. So, I don't see any problem. No dilution of our brand. It's similar to having a textbook with the imprint of any good university on it.

The real problem is the loss of the university image. If we allow someone else's courses to fill the slots in our curriculum on a wider scale, I would expect as strong resistance as Martin has shown, just because it would be inconsistent with the traditional historical image of the university. This problem is up to sociologists or cultural scientists to study, not to economists. There is no doubt it does exist and it will definitely affect the choice, though.

**Carnoy M.** I don't think there's any problem in putting MOOCs online. By the way, Stanford doesn't have its own university that runs MOOCs. They basically put the course on Coursera or some-

where else. I haven't followed the Coursera business for the last 6 months. I've heard they've raised a lot of money from investors, but I haven't heard how they're going to basically capitalize all these courses. Because someone has to buy all these courses. Someone has to pay for them.

In other words, it's very nice to run a course, many of my colleagues have done it for Coursera and they put them online, and they didn't get paid for it. It helps the reputation of the university when it has a bunch of courses on Coursera and that's the reason the Coursera has been able to convince professors to do that. But the next stage is how to monetize it. Otherwise, Coursera is not going to live.

MIT has all of their courses online, because Hewlett-Packard gave them 150 million dollars. They invested all of it into online courses. Nobody's paid Stanford a penny for putting courses online. The logic here is, it's no cost of the university, because we're not giving a degree. Perhaps, at the next stage the university that launches the courses will say, "We're going to offer a set of courses for the economics department, and if you take those courses and pass them, you get the degree in HSE."

So, I know you're not saying that's what you're going to do, but if you put MOOCs online, does it mean you're changing the structure of the university system? At first, as you said in the beginning, you're creating a library of resources that people can use for free. And then inevitably comes the question, how will this affect the whole university system in future? Perhaps, it will be subsidized by the government, the government will say, "We believe this is the best model for the universities, so we give money to MSU, HSE and MIPT to do these courses, and we pay other universities so that they could buy these courses." And that's going to work.

But in a free market, in which Coursera is a private business, the question is how does this private business produce revenue? The idea was that these other universities would buy these courses. Maybe they don't hire new professors, they don't fire anybody but they start to pay for it. So, for them there's got to be some reason to pay for this. They've got to believe that the students are going to perform better or at least they're not going to perform worse with these courses. Well, this has been the barrier. The barrier has been that they haven't convinced that even in the easiest courses like Statistics-1, which should be really quite suitable for MOOC, students could do better on the course. Therefore, the universities are rejecting it.

The barrier is not for HSE to produce MOOCs and put them out there and you're right it doesn't lessen the prestige of the university if they put their brand on a course. But for online learning to develop, it has to become somehow economical. I can produce wonderful art, but if nobody buys the art, I will soon have to do something else. And the question is how can people be so convinced by the value of these MOOCs that someone is going to pay for them?

**Derkachev P.** (*Institute of Education, NRU HSE*). It's good news that universities will not disappear in the nearest future as online courses emerge because—as Martin has just mentioned, universities mainly advertise themselves through online courses. It's true that universities have become sort of corporations of knowledge, they know how to separate between useful and irrelevant information and how to build good courses. Some powerful competitors can probably appear in the nearest future to pull out some students from these universities, but it's still up in the air. However, my question is in a bit different area. William Baumol, American economist who studied pricing policies in different types of services including culture and education, he saw that industries with personally provided services also produced segments of mass-scale services, where information could be replicated, performance remaining on the same level. It culture, it's pop music and the production of CDs. There is the segment of concerts, where people are ready to pay quite a bit of money to listen to live classical music. But there's also the segment of cheap CDs. So, everyone can choose whatever they like. My question is, can we expect, by analogy, that there will be “pop-star professors”—not just academic stars, but pop-star professors whose courses will be purchased by millions of students, and they will get millions of dollars only by charging, say, 10 cent per student? Do you think it would be right to link the salaries of such professors to the number of students in their online courses, or is there any other economic model the universities have in mind?

**Carnoy M.** This question also has to do with the ownership rights issue Yaroslav touched upon several minutes ago. I agree that the economics of online is an incipient subject. As for the ownership rights, let's imagine you have a very popular MOOC taken by a lot of students and used by a lot of universities to advance their reputation. Ten years from now, professors are going to demand to be very well-paid to give that MOOC if that MOOC is very important for university reputation. It can easily happen but I don't think such professors will become pop stars. I don't think millions of people would like to study economics. Paul Samuelson was in a way a pop star, but he made millions on his textbooks. And the reason he made millions is because that textbook was required in universities. It wasn't because people had to read Samuelson's *Economics-1* as the way to sleep at night, to get new business ideas, but because someone required them to read it. And the question is this: I'm teaching the course, Samuelson wrote a textbook. I require my students to use that textbook on *Economics-1*, and I still have a job. I can use Samuelson's textbook and I can still get a salary. But will I be paid if I use a MOOC? I'm not sure I will use that MOOC if it might deprive me of my salary.

And that's what's happening in the United States. So, maybe in Russia you can force some universities in Krasnoyarsk or Perm to use a course created by MSU and say, “Get rid of that professor because

the MSU professor is much better and students can take her lectures online.” Business models aren’t working in the United States this way. A professor can say, “Go and look at these lectures, you might find them useful.” But they’re not going to say, “Use those lectures instead of my lectures.” And if it eventually happens some day, those people whose lectures are being used will demand a lot of things. So, intellectual property is going to be a big problem in this sense.

**Kuzminov Y.** Well, it’s true, we can imagine we’ll have highly popular professors with millions of people subscribing for their courses. For example, there’s Bolshoi Theatre, they have several star dancers in the troop who have their own businesses, their own theatrical concerns. And that’s how all the opera theatres all over the world function. There’s also healthcare, legal practices, art and some other spheres where they have quite different systems to get their revenues, different types of organization. We only need to look around, because they’re readily available around us.

**Isayeva N.** (*Institute of Education, NRU HSE*). Let’s suggest the second-tier universities will replace almost all of their curricula with MOOCs, but the modular program implies that every course is part of the puzzle, with tabs and blanks. In this regard, MOOCs are rather isolated, self-sufficient and very hard to connect to each other. Doesn’t that mean higher costs to provide some instruction design using a set of MOOCs for the universities who will buy them from better universities? And could the third-tier universities afford this design to incorporate courses wisely into their curricula? Or maybe it’s not universities but virtual universities or some third-party agencies that should take on the function of accrediting individual trajectories of students who pick these courses?

**Kuzminov Y.** I think the answer to your question is right there because in Russia there’s the National Open Education Council created; the Ministry of Education takes the eight leading universities on board and allocates tasks to do MOOCs among them. Russia is a country where standards of tertiary education are imposed by the national government, so the prerequisites are easier to calculate. However, I believe it’s easy to provide even in the countries where there’s no government-standardized education and where universities have to build their courses themselves. There are quite a number of courses already available on the market that indicate their respective prerequisites including textbooks and online courses alike. In some places they are available, in others they’re not.

**Derkachev P.** (*Institute of Education, NRU HSE*). Don’t you think the dropout of students from MOOCs can be related to the fact that no optimal format has been designed so far? I think there’s been a great



number of people who are trying to take MOOCs to get edutainment, i. e. people who enjoy learning. However, they realize that it's not something like customary YouTube video lectures with no continuation or testing, they realize that it's something quite different and they turn away from MOOCs. So, those who offer MOOCs have not found the right balance between education and entertainment.

**Kuzminov Y.** Well, that's probably true—we have seen a great number of providers of such courses in the market recently. They offer courses of three types. The first type is purely academic courses using necessary control mechanisms and education programs of the leading universities. The second type is the so-called introductory courses associated with edutainment. They are very important, because science communication is crucial to facilitate the choice of field of study. However, this is not the type of courses you get credits for. At the best, they can be used as elective courses. And the third type, which you didn't mention, is business courses, online business education. There's been a number of attempts, in Russia and in other countries alike, to create completely closed courses with expensive subscription to give purely online business degrees. To me, this model is a profanation. I don't believe in business education online just as in any practical courses put online, but we've seen such attempts anyway, as human enthusiasm goes a long way.

**Carnoy M.** I think Yaroslav is right, if you make an accounting course part of your degree program, the dropout rate will be very low actually. A high dropout rate means the course has been chosen randomly. People just do it for some time, then treat it as an entertainment, and then they drop out.

In the Open University of Catalonia, it depends on the degree, but in some cases up to 50% of students actually finish two- or three-year degrees in certain programs. They actually finish the course—and not one, but many courses. However, the degree completion in Phoenix University is quite low. It depends on federal money heavily. There was an audit done by the federal government and it found out that only 16% of students finished the degree—not the course, but the degree within 6 or 7 years.

It would be very interesting in Russian context whether the universities will accept as part of their regular curriculum to use courses by another university, as a substitute for the course being taught by someone in that university. I'm also curious whether someone will be willing to pay for that.

Actual learning outcomes are one of the factors that determine how much universities are willing to pay for online courses and whether government is going to keep supporting paying for that. We need to determine: if a course is taught by a professor for a leading university, how likely will students at this university be to finish their de-

gree successively? Will their final grades be higher than or at least as high as in traditional education? When we get this data, we'll see how it works. However, there is little relevant empirical data. We know that some online universities get quite good results in how much the students learn. But those are not MOOCs, those are courses with a lot of support by professors who monitor each student and email them and give them feedback. There's a support structure for the course and it's part of the degree program, so there's an incentive to finish it. In such universities, the dropout rate won't be that high. The quality of such education, the very possibility of achieving good results with having even lesser professors in the course—that's the question. There is a group of people who are automatically ready to criticize these courses. And that's the faculty of the university. They're not going to like this. "The course is not great, the course does not produce good results, we don't want this course." And I'm not saying this hypothetically, this is exactly what happens in the United States. So, I'm really interested to see what happens here. Good luck!

**Kuzminov Y.** Thank you, Martin. I think we are in a unique situation with online learning right now. On the one hand, online courses from third-tier universities have spread very wide. 20 million users is a great portion of the world education system. On the other hand, we have no idea what the economic model of online education should be like. So, we have a lot of sociological questions as to how they are going to be implemented and what kinds of new institutions we are going to see in the education system.

I think there will be a huge difference between the educational systems that have reached the minimum quality of education—such as in the United States, Japan, South Korea—and the countries with mass-scale education systems, most of which are actually kind of profane. I'm sure the governments of these countries will encourage cheap solutions like that if they see they can hold control of the education outcomes.

And there's yet another comment regarding the high dropout rate mentioned by Martin. I've already said that a 90% dropout rate can be explained by the function of choice. This is an advantage of MOOC, not a drawback. In any offline learning system, you're just unable to "take a look" at a dozen of courses and pick one. Online, you're free to do this, but the online should be completely open.

So, the real dropout rate is three or four times lower, and 20–30% is not that high. Well, it's twice as much as the average dropout rate in the global educational systems.

However, we can offer yet another explanation for this high dropout rate. The fact is that in adult education—and half of MOOCs are adult education—we don't have "educational trajectories" as a certain tradition or standard, we don't have any real understanding that we should take a series of courses. What we have is the phenomenon

of universal higher education. Even lower-educated families know that their kid should go to the university, otherwise they'll work as a janitor, will never marry someone good and intelligent and will probably end up becoming a gangster. So, they do have a clear idea of the social norm. However, those who already have some university background might only feel they lack something but there is no norm to guide them properly.

Professional standards could become this sort of guidance. Yet, many countries lack professional standards on the core competencies. I think that's not only Russia's problem but a global problem, too, and if we make progress in shaping detailed professional standards, which serve good signals on the labor market as they're cheap for competency holder and free for employer, online courses will be absolutely clear and suitable for preparation for offline exams, and the dropout rate will be nearing zero. There have already been examples like that. There is CFA, international financial analyst certificate which includes a number of professional competencies that can be a combination of MOOCs or pieces of MOOCs. People who prepare for CFA engage heavily in online courses alongside their offline studies. So, I think this sort of explanation can probably reduce the uncertainty about the high dropout rate with MOOCs. Anyway, as long as we've already set up a theoretical model, it probably makes sense to confirm or refute it empirically.

**Carnoy M.** Thank you, Yaroslav, for this wonderful and useful exchange. You have given me a lot to think about. I believe Yaroslav is correct in saying that the scenario he describes is possible and perhaps even probable, that MOOCs will be used in many different ways—as a new kind of textbook, as a form of access to specific courses for specific kinds of learning, as even a substitute for face to face lectures in university courses. A combination of completing ten MOOCs may even constitute a degree—a new form of on-line education where the only interaction students have with live people is with other students taking the MOOCs. I believe Coursera has created a business degree based on MOOCs with the University of Illinois. All this would definitely transform part of the higher education system a lot, as Internet technology already has with private, for-profit on-line education. The part that is and would be further transformed would be higher education for older students, who already have jobs. I do not believe that using MOOCs as new kinds of textbooks is really a transformation—having students at an elite university in a face-to-face course watch a MOOC instead of reading a textbook is just a substitution of one kind of medium for another.

The real question for the future is whether MOOCs made by professors from local or foreign elite universities will or should serve as the principal strategy for transforming degree-granting programs at second and third tier universities. If Yaroslav's vision for transform-

ing the university system is realized, in Russia MOOCs will play this role. He may convince the Ministry to try to implement his vision, but I would simply warn him and Russia away from such a strategy. The dream in the 1970s of using educational television to improve schooling in low-income countries and, in the 1980s, to use computer assisted instruction to improve schooling everywhere has never worked. It just had no effect on student learning. Ultimately, technology of any kind—books, blackboards, videos, computer software—in the hands of great teachers can enhance teaching. But technology has never been able to serve as a substitute for good teachers. It has never been able to produce the same kind of learning experience as a good teacher. In the United States, we do not have a great university system because we just have 20 or 30 great universities. Students can go to any of hundreds or even one thousand universities and colleges and get an excellent higher education, if they are willing to work hard and use the resources of their university or college to interact with professors and other students, picking up the hard and soft skills that will make them more productive and better members of complex societies. In the U.S., we have been able to train enough excellent PhDs and hire them in our university and college system to provide that education. Yes, MOOCs could serve to enhance teachers' repertoire of technologies so they could become better teachers, but they still have to know how to use those technologies effectively. That is the lesson we have learned in the past, and it is an important lesson.

It would be a terrible mistake to believe that Russian second tier higher education will be improved by relying on MOOCs or on-line courses of any kind. It might save money, but it will not improve the education students receive. It may even make it worse. The only way to achieve a great higher education system is to have enough highly trained graduates coming out of the pipeline in order to staff even the second tier universities with smart, good professors, and to give them the necessary resources to do their jobs effectively.

**Kuzminov Y.** Well, thanks a lot, Martin, colleagues. I have really enjoyed the discussion. Online learning is a source of endless intellectual challenges. I think we have approached at least two topics on which we could organize similar discussions later on. First, the dropout rate issue, i. e. unsatisfactory completion of the educational trajectory at various levels of education. And second, the economics of education as such. This problem is getting new dimensions now, as education has gone far beyond the familiar structures. I suggest that we discuss these two when we meet again.

I also propose topics that we have left almost untouched today:

- The emergence of new producers and suppliers of courses and the role businesses will play as soon as there is a consistent and effective demand. Most probably, their number will be the highest

in Russia and in other countries with a state regulation strong enough to make other universities accredit and pay for the courses. As soon as there is effective demand, independent providers will enter the market, just as private publishers entered the publishing market once. The face of higher education will change;

- Another possible effect is the dilution of curriculum, the trend towards personalized curricula, the emergence of personal educational trajectory advisors. Again, they may appear by themselves or be hired by universities, in this case under the university brand. That is, universities will act as agents issuing degrees based on MOOCs, in the limiting case without even contributing to the education. However, it won't be weak universities, it will be strong universities that can make profit by promoting their brand. Most likely, the degree will be somewhat different;
- Universities will develop from centers of knowledge transfer and dissemination into centers of talent selection and development. Intellectual corporations will focus more and more on creative activities, discarding the routine;
- An important quality mark of MOOCs is recognition by the leading universities: universities should give credits for them;
- What should the state do? Ensure a broadband online access to as many locations as possible. Provide grants for MOOC creation. Finally, build the legal basis for giving credits. What sets of MOOCs will be optimal for which countries?
- Making up for peer effects in MOOCs: virtual discussion platforms, mutual feedback. MOOC Wiki;
- The influence on professors: students' evaluations make them either teach better or leave. The pressure of good students is getting stronger, as now they get information not only from "another textbook" but also from "another course";
- The most effective format is mixed learning, where MOOCs are used as both substitutes and supplementary material for offline courses. For students, it first of all expands radically the options in terms of educational trajectory, skill set, and specific methods of learning;
- The "pop-star effect". Availability of the best scientists as regular professors: wider audience, possibility of retaking courses for an unlimited number of times;
- MOOCs as a way to consolidate the Russian-language education space.