THE II INTERNATIONAL WORKSHOP CONFERENCE «MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN HIGHER EDUCATION: NEW EDUCATION PROGRAMS, PEDAGOGIC WITH THE USE OF E-LEARNING AND EDUCATION IMPROVEMENT»

09-10 of April 2014 Sapienza University of Rome (Italy)

Sapienza University of Rome
National Research University of Electronic Technology (MIET)
Bauman Moscow State Technical University
Institute for Qualification Improvement and Vocational Retraining

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DISCUSSIONS

WELCOMING SPEECH

Luigi Frati
Sapienza University of Rome, Rector

Dear Speakers and Guests of the Conference,

the excellent results obtained from the realization of the two-day meeting on "Modern information and communication technologies in higher education: new education programs, with the pedagogic use of e-learning and education improvement" is, for the University of Rome "La Sapienza ", a great source of pride at international level Although being the Rector of one of the oldest universities in Europe – the foundation of "La Sapienza" goes back to a papal bull of April 20, 1303 – I did not look for scientific legitimacy, nor attract students resorting to the tradition and to the past. On the contrary, along with my closest collaborators, the teaching and the administrative staff, we have tried to move our University forward, accepting all the challenges of the third millennium to scientific research and to high level training within the Italian education system Our motto, after all, is: "the future passed here".

In responding to the future not only of the University "La Sapienza", but of the entire "Italy system", I am convinced that a crucial role is played by our ability to create new and dynamic synergies with an important strategic partner as the Russian Federation and for this reason we have set up a fruitful partnership with the National Research

University of Electronic Technology, the Bauman Moscow State Technical University and the Institute for Qualification Improvement and Vocational Retraining, of which the International Conference of April 9 and 10 is a result of high significance, the event that has become a tradition which we hope to continue and to develop.

I am sure that the common wish of all the prominent institutions participating in the organization of the Conference, in addition to the natural tendency to scientific-academic dialogue, is to create a meeting place where the Universities constitute only the leader of networks including both public and private institutions. This is to prove once again that scientific knowledge, in any field, can contribute effectively to the development of our countries as well as being a help to entering the world of work for our students.

Anatoliy Aleksandrov
Bauman Moscow State Technical University,
Rector, Dr.Sci., Professor

Dear partecipants and guests of the Conference!

I am pleased to extend my greetings to you, and I am glad that our conference takes place in the magnificent city of Rome, within the walls of one of the oldest universities of Europe.

Translated into Russian «La Sapienza» means wisdom. And, according to the famous Dictionary of the Russian Language by Ozhegov, wisdom is ability to apply one's knowledge in a reasonable way, mind of great capacity guided by one's own and other people's life experience. Our conference, a vivid example of knowledge and experience exchange, is focused on the development of educational technologies and education quality improvement. Information revolution, consisting in rapid and overall development of information flows and technologies, is tangible success and one of the main aspects of globalization. Modern high-quality education is impossible without mutually beneficial communication and exchange of knowledge, information, and technologies. Moreover, considering the modern volume

of information, transmission and perception of knowledge cannot be provided without electronic technologies.

BMSTU, one of the leading and oldest universities of Russia with deep-rooted traditions and scientific schools, takes active steps to apply new forms of education, including E-Learning. Our educational programs of engineering training have always been notable for their fundamental character, but we keep updating and improving them, shaping new competences on their basis.

Participation of scientists and specialists from the best Russian higher educational institutions, such as Moscow State University, National Research University of Electronic Technology, Russian State Academy of Intellectual Property and many others, will doubtlessly enhance the authority of the conference.

Ages and epochs pass by, pace of life grows, but human aspiration for knowledge remains unchanged. Lone geniuses are ancient history. Science and education become international, and our job acquires new sense. Together we must train the specialist of the future, who will be able to work as a part of international team all over the world.

I am sure, our conference will be a contribution to this aim. I sincerely wish you fruitful results of the conference and success in your everyday work!

Yuri Chaplygin
National Research University of Electronic Technology,
Rector, Corresponding member, Russian Academy of Sciences,
Doctor of Engineering Science, Professor

Dear participants of the conference!

It is a great pleasure for me to address words of welcome to all participants of the Second International Conference at Roman university La Sapienza! The urgency of issues discussed at the conference demonstrates the significance of information and communication technology in higher education modernization process which is spreading over the whole international university community nowadays.

The new educational technologies lead the higher education and professional retraining process to the more advanced level, integrating new knowledge generation and education in the high-technology innovation environment which involves research, knowledge-intensive production and education. This process is encouraged by a wide spread of open educational and E-Learning resources, which makes higher education more available and provides conditions for academic mobility development.

All these factors contribute to building up open and flexible systems of staffing high-technology industries able to respond quickly

and efficiently to requirements of labour market and new technologies, make university graduates more competitive both domestically and internationally.

I am sure the successful work of our conference will exert a considerable influence on strengthening international relations in higher education, broadening university interaction in accordance with new labour market requirements. I would like to wish successful and fruitful work, new ideas and projects in the field of mutually beneficial cooperation to all participants of the conference!

Vladimir Kinelev
Institute of Qualification Improvement and Vocational Retraining – MIPK, President, Doctor of Technical Sciences, Professor, Academician, Russian Academy of Education

Dear Colleagues!

It gives me great please to greet the participants in the Second International Theoretical and Practical Conference on Modern Information and Communication Technologies in Higher Education: New Education Programmes, Use of E-learning Technologies in Teaching and Education Quality Improvement.

Today we have gathered within the precincts of one of the largest and oldest universities in Europe again to discuss the education issues of greatest importance, which are the issues of its content, quality and availability. Time presses and persuades us that as long as our civilization develops, people without education are more and more often pushed to the brink of losing proper living conditions required in the modern society and that infringing upon human right to education as well as its low quality lead to intellectual and cultural personal degradation.

Rapid development of information and communication technologies gives new opportunities for solution of these fundamental prob-

lems of education and at the same time sets us new numerous and challenging tasks, which no country can solve independently whatever is its economy level and scientific and technical potential. What is in demand is unification of efforts of scientists and teachers all over the world, which such international forums as our scientific conference are largely intended for.

I am convinced that following the discussions and exchange of results of scientific researches and practical activities, the participants in the conference will gain a new creative impetus and broaden their horizons in relation to possible ways of successful solution of modern problems in higher education.

MAIN TOPIC

EDUCATION AND INFORMATION IN THE HISTORY OF CIVILIZATION

Vladimir Kinelev

Doctor of Technical Sciences, Professor,
Academician, Russian Academy of Education,
President, Institute of Qualification Improvement
and Vocational Retraining – MIPK

1998-2008 – The director of UNESCO Institute for Information Technologies in Education
2009 – The head of UNESCO Chair "Knowledge society and new information technologies"
The doctor of Technical Sciences, the Academician of Russian Academy of Education

If we attempt to take a look into the future in order to define what the main aspects of education and human civilization will be in the twenty-first century, we are aware that the beginning of the new millennium is much more than simply a red-letter day on the world calendar. It impels us to comprehend the past, to form a new understanding of the meaning of life, to determine the contour of the future, as well as – and this is particularly important today – to unite our efforts which are directed towards the building of a better future for all people living on our beautiful planet, the Earth.

It so happened that destiny has bestowed on us the privilege of taking part in this remarkable event. Moreover, it has given to us great responsibility for what the world will be in the twenty-first century. These two sentiments compel us to look back in order to reread the great book of mankind's progress towards knowledge. This is a book in which pages of the great triumphs of the human mind alternate with pages which are full of tragedy. I believe that each of us is excited by the thought that the most part of the pages of this centuries-old chronicle are still capable of arousing our interest in the great revela-

tions and calamities of humanity on its advance over many thousands of years towards the unattainable, and hence even more coveted, Truth. 'You will know the truth, and the truth will make you free.' – such is the promise given to man in one of the most ancient books.

Already the first few steps taken by mankind along the path of knowledge have confronted us with the problems riveting our attention today: those of the accumulation, selection, systematization and transmission of information. The stone walls of caverns, the clay tablets of the Assyrians, the papyrus manuscripts of the Egyptians and the Greek parchments were the first vehicles of information where our ancestors recorded and tried to hand down to succeeding generations their experience of the world around them through drawings, cuneiform characters and letters. However, many centuries passed before man, burdened with the very load of accumulated facts, started to reflect on the necessity of their selection and systematization, and drew an unsteady but crucially important outline of future science.

It is well-known that science, as the purposeful study of the laws of natural phenomena and society, originated among the ancient Greeks. Their original manner of thinking and acting, as the British scholar John Bernal asserted, consisted precisely in that aspect of their life which we have termed the scientific mode of thinking. Since then science has come a long path of difficulties and contradictions. But what does the experience of ancient peoples tell us? What part of their great heritage is it that we should bear in mind? First and foremost, their constant connections with nature, their faith in the universal principles of life, their determination to proceed in their constructs from the organic unity of the world around them. Science and art, in their view, are equal partners in the common process of creative work and creation. For instance, in some hymns 'Rigveda' the numeric ratio of the world order is in a famous analogy with music; the principle of harmony in Pythagorean teaching and his followers is science and music.

This harmony, which is a challenge to the imagination of modern man, was berhymed in highly figurative style by the great Russian poetess, Marina Tsvetayeva:

We are asleep, but through the slabs of stone
We see a guest from the heavens in a garb of petals.
O world, you need to understand!
A bard discovers in his slumber
The law of stars and the formula of flower.

Knowledge storage, and the formation and development of spiritual and intellectual life appreciably change ethics and customs. It becomes clear that who has ever learned the mysteries of knowledge accumulates fantastic power by which he or she 'rules everything through all'. The problems of education began to attract not only philosophers and men of letters, but also politicians. Education assumed a mass scale. Schools and colleges mushroomed. The intelligence of the ancients deserves admiration. As it seems to me, they were aware that a high level of upbringing and education among citizens had enormous significance for the destiny of a State, because upbringing and education shape human character: democratic education serves democracy and reproduces its structural order, while oligarchic education reproduces the oligarchic lineage as inexorably Time has proved the wisdom of Aristotle's phrase: 'Superior education maintains a superior order'.

Taking a cursory look at the ancient framework of civilization, what do we see? It was built by outstanding architects and engineers; all of the most important elements of education and science have come down to us from hoary antiquity and have maintained their significance until the present.

Succeeding epochs – the Age of Enlightenment, the Renaissance – certainly made a contribution. Beyond all doubt, the palm of precedence belongs to Italy, the homeland of the Renaissance. It was precisely in Italy that the first European universities arose. Academies of science and centres of world culture were born. Under its radiant skies, Michelangelo and Leonardo da Vinci created their immortal works. One of the rulers of Florence, Lorenzo Medici, instituted Europe's first public library; the Venetian Republic adopted laws on patents, the first in mankind's history. We owe to the Italian humanists the 'heavenly golden rain of ancient manuscripts' that fertilized the soil of the following eras.

Printing is the next, and perhaps the greatest, stage in the information revolution. It is clear that ancient manuscript scrolls could not lay the foundation for the development of mass education. The invention of printing raised the institutions of general education to a previously unattainable height. The reformer Luther translated the Bible and demanded that the authorities open schools for the enlightenment of young people in all cities and towns of Germany. The famous Czech educationist Comenius wrote the 'Great Didactic', in which he expressed his desire of 'teaching all things to all men', that is, he substantiated theoretically, as it were, the principle of democracy, encyclopedic knowledge and professionalism in education, in which lay many precious seeds of future educational 'harvests'. At a much later date, the great Denis Diderot would pronounce the wise words praising the book and education: 'People cease thinking when they cease reading'.

All of this prepared for the advent of a new epoch, the Age of Enlightenment. It was associated, in the first place, with the leaders of European thought and culture: Locke, Montesquieu, Descartes, Pascal, Voltaire, Diderot, Rousseau, etc. We could go on with this constellation of great names, but the most ponderous contribution to the school of modern science was made by Francis Bacon. He penned a number of outstanding works explaining the idea of the Great Resurrection of Sciences, which laid the foundation, as I see it, for the scientific, technological and information revolutions of the future.

The great saga of human knowledge contains pages that are unique, and I would list first among them those which contain examples combining the potentials of the human mind and technology. Of course, tools, instruments and machines have long been used by man to accomplish practical tasks. The new times, however, required new machines. Human beings fully realized how difficult it is to undertake construction, pursue scientific research and handle commercial trade deals relying simply on the resources of the human mind, which, in addition, was extremely unreliable as a 'databank'. Death broke the threads of life and relegated to the abysmal realm of Hades many discoveries of great value, such that the secrets of ancient masters could easily have been irretrievably lost. It was probably from the 'ring of Pascal', as his contemporaries called his calculating machine, from the

adding and multiplication machine of Leibnitz that the first faltering steps were taken towards the modern world of computers. The entire further history of human activity is inseparably linked with the development of means of selection, storage and transmission of information. The invention of the typewriter, telephone, telegraph, radio, dictaphone, television, computer, and the modern means of overland and space communication are all stages in the triumph of the information age.

But what does Internet information mean today? This concerns an enormous area of scientific knowledge associated with the reception, storage, processing, transmission and use of information.

It is hard to overestimate the influence the informatics has had on progress in practically all sciences. It has not only multiplied the possibilities for obtaining ever more complete knowledge about subject matter, but has also brought about the need for developing a new philosophy of scientific research in all sphere of intellectual and practical human activities. The large scope of the processes which are taking place in information technologies at this turn of the century, their growing role in forming the image of the present and future of mankind, lead us to search for similar examples in the century that is closed. As Ecclesiastes said: 'Is there any thing where of it may be said, see, this is new? It hath been already of old time, which was before us'. Looking back and assessing all the achievements of the past century, 1 shall venture to single out one main thing: the concept of relativity laid down by Albert Einstein, Sigmund Freud and Karl Marx in the material, spiritual and social worlds. Their brilliant insights gave mankind the possibility of realizing that the world is not what it appears to be, that we cannot trust the empirical perception of the concepts of space and time, good and evil, law and justice, and the nature of human behaviour in society. They gave back to people an awareness of the fact that concepts and laws reflect not only the objective reality of the material world but also the social world, of which Thomas Hobbes remarked as far back as the seventeenth century that 'all social laws of the state must obey the same rules as mechanics and geometry'. A violation of any of these principles inevitably leads to catastrophe. Unfortunately, the past century has given us quite a many

examples of how these fundamental truths have been overlooked, causing irreparable harm to nature, the world of living things and mankind himself.

The twentieth century is closed. We are became the witnesses of the twentieth century's departure, which has shown the world features of a new civilization never before known. Man has made a breakthrough into outer space, descended far into the ocean depths, designed sophisticated machines, harnessed thermonuclear energy and become its hostage, learned to use the wealth of nature on an unprecedented scale, but succeeded to a lesser extent in healing the wounds caused to nature. Man has proved ill-adapted to this new era in the development of civilization. This did not happen just today but first began to appear somewhere in the 1930s and 1940s, when some of the outlines of the coming scientific and technological revolution in energy, space and information appeared on the horizon. The Spanish philosopher Ortega y Gasset noted this in 1930 when he wrote: 'Today catastrophe is visiting man himself who has become incapable of keeping pace with his civilization. An expanding civilization is nothing less than a painful problem. The greater the achievements, the greater the dangers to civilization.'Since then, eighty years later, that contention has been corroborated hundreds and thousands of times.

Individual representatives of culture or of the ecological movement are often quite helpless in their efforts to curb the instincts of the crowd clinging to a comfortable way of life. It becomes more and more clear that E. Fromm's prophecy comes true: that humanity, is forced by the state and financial institute, within the framework of well-known dichotomy – to Be or to Have – will choose "To Have" and, as a result will go away from striving for self-fulfillment via the development and creation to illusive and low-lying self-satisfaction. In this context, it becomes obvious that the entire system of knowledge about the world, man and society must be exposed to an agonizing re-evaluation. In this context, it becomes obvious that the entire system of knowledge about the world, man and society must be exposed to an agonizing re-evaluation.

That is why the leaders of virtually all countries striving to prepare the citizens to respond adequately to the challenges of the twenty fist

century have professed the desire to transform their countries into learning economies and learning societies, inasmuch as the information society needs competently knowledgeable citizens. The age of new information and communication technologies does not eliminate the most difficult problems that the world of education faces now and that have to be solved irrespective of whether the new technologies are adopted or rejected. Nevertheless, methods of training and development, social and professional requirements, globalization of communication, economic and political projects related to the construction of a new society – all this is highly depended on the level of information and communication technologies in the educational process.

Education for emerging society requires information and communication technologies to meet large scale learning needs arising from social and economic development. For the first time in history, information and scientific knowledge are not simply a means of improving society, but are becoming the main products of the economy. Moreover, the knowledge is the main asset and product of the information society upon which continued economic well-being and social development depend.

The problems which are connected with the organization of the educational process acquire the key importance for the origin and development of the information society. The development of modern information and communication technologies creates the environment which is characterized by rapid and continuous change. Nowadays, the speed and the scale of change break the traditional framework of historical social development stages. For the first time in the history of our civilization, generation of ideas and technologies shift each other faster than the generation of people. Changes displace the continuity and stability even in the scope of private life. Furthermore, the variability manifests itself through the diversity, which has no analogues in the past and it leads to the impossibility to define our era with the help of a single event or a social phenomenon. Such an environment requires a new approach to education. For people today it is essential to have not only new practical skills and theoretical knowledge, but also the ability to continuously improve their knowledge and skills. In other words, for humanity it is necessary to

learn and develop in every way a culture of learning throughout life. New information and communication technologies destroy the framework of the traditional educational process. Education can no longer be considered as a ritual which is characteristic to the early period of human life. The using of information and communication technologies leads to the overcoming of age, temporal and spatial barriers and brings everyone the opportunity to learn throughout life. People of all ages are constantly learning new things everywhere, in a variety of conditions and thereby they form a learning society.

Information and communication technologies offer amazing opportunities and prospects for their use in teaching and learning, thus they confirm that mankind is on the threshold of a new educational revolution, the results of which will be fundamental changes in all areas of human life. These circumstances, which are coupled with new social demands, the new global community, which evolves from the application of information and communication technologies and new patterns of activity, generate a need for a new level of literacy, which corresponds to the request of informal-oriented society. New level of literacy requires new technologies for acquiring some scientific knowledge, new pedagogical approaches to teaching and learning and new courses and teaching methods. They should boost the intelligence of students, their creative and intellectual abilities; they should develop the holistic worldview of the individual, which helps him to take a strong position in the information-oriented society. Thus, it would be wrong to think that the use of new information and communication technologies automatically improve the quality of education. To make efficient use of their opportunities for a teacher-methodologist it is essential to master, develop and actively use computer psychology, computer didactics and computer ethics. It is always important to bear in mind that despite the diversity of sources of information and educational technologies which transform information into knowledge, there is only one way of turning knowledge into education. This transformation takes place in the human mind. Thus there is a very interesting and mysterious interaction of human consciousness with cyberspace, in which a person is born and develops. This allows us to assert that there are not two identical educa-

tions and that education which evolves from this interaction, differs in the same originality as an individual, inasmuch as each person is unique. The priority of the person, which is established as the fundamental value of the society in the last century, becomes a major imperative for its further development in this century.

One of the main tasks of the emerging learning society is the creation of an educational environment that would overcome two major obstacles in human communication: geographic distances and differences in the abilities of various individuals to perceive and convey the same information, especially when it comes to people with special needs, which, to various reasons, are unable to get some education by conventional methods. Today's level of development of information and communication technologies lays the foundation for building of a global system of e-learning distance educations, helping people to create an open information environment without boundaries. Regardless of the physical distance, new information technologies provide an immediate and interactive communication between teacher and students, as it is always is the defining characteristic, and an undeniable advantage of full-time study. New information technologies, as well as a man-made artificial intellectual environment can at least partially restore the abilities of many people, and communication capabilities, which were deprived by their nature, by environmental disasters, by military conflicts or human violence. Perhaps, this is the main humanitarian trend of using information and communication technologies in education and other areas of practical and spiritual human activity.

It is impossible not to draw attention to the fact that the rapidly increasing scale of application of information and communication technologies in education and other spheres of human activity requires the formulation of a completely new ethical, psychological, legal and moral principles of these technologies use, because information and communication technologies are not simply multiply the intellectual abilities of a person, but also create an ordered system of a new global culture. Beyond all doubt, information and communication technologies offer unprecedented opportunities for productive human communication; nevertheless the dark side of human nature also penetrates into cyberspace. Nowadays, there is a full range of low and rep-

rehensible moral manifestations in the "World Wide Web": aggression, violence, crime, deceit, cruelty, brutality. It is also significant to note that that the global nature of new information and communication technologies not only opens up tremendous opportunities for the dissemination of knowledge, but also increases the risk of conflict between the values and norms which are inherent in different cultures. Therefore, in order to embody in life the global information community successfully, we should develop and apply in practice the effective mechanisms of information exchange which constrain the blurring of national and cultural identity. The last century has clearly shown that there are neither small cultures nor small nations in the great history of the times and peoples: only together they comprise the highest value of modern civilization and the basis for sustainable development of the world community.

I hope that in the twenty-first century the main value imperatives of our civilisation in the international cooperation will be connected with the creation of a common educational space, about which Ch. M. Talleyran said more than two hundred years ago: "Education is a truly special state, the influence of which cannot be defined by single person, and even national authority are unable to delimit its frontiers: the sphere of its influence is immense, it is infinite…".

Plenary session

ACTUAL WAYS OF IMPROVEMENT OF COMPETITIVENESS OF MODERN UNIVERSITIES: INTEGRATION OF EDUCATIONAL INNOVATIONS AND SCIENTIFIC RESEARCH ACADEMIC MOBILITY AND NETWORKING INTERACTION OF UNIVERSITIES INTERNATIONAL COOPERATION AND NEW DEMANDS OF THE LABOR MARKET IMPROVING THE QUALITY AND ACCESSIBILITY OF HIGHER EDUCATION ON THE BASIS OF E-LEARNING

International cooperation of "Sapienza" University

Antonello Folco Biagini
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Abstract
University education represents the last and the highest level of education in the student's carrier. One of its distinctive elements, in comparison to other levels of formation is that on this very phase, for the first time during the study period, one tries to make the theoretical knowledge go outside the University building and make the student take their first steps in the real world. This appears to be very of high importance especially nowadays, when there are no limits for communication and travelling, which could obstacle this process in the past.
Keywords: university, education, internationalization.

University education represents the last and the highest level of education in the student's carrier. One of its distinctive elements, in comparison to other levels of formation is that on this very phase, for the first time during the study period, one tries to make the theoretical knowledge go outside the University building and make the student take their first steps in the real world. This appears to be very of high importance especially nowadays, when there are no limits for communication and travelling, which could obstacle this process in the past. Same as for the students, the university education incentivize professors and researches to confront with their colleagues and theories, elaborated outside the national borders in order to amplify the impact of their offer on the process of "culture" formation and to

transform it into a highly requested competence at the moment when young people have to face the labour market. Thus facing external realities has more value when it is perceived through foreign institutions, information and experience, different both intellectually and physically from one's academic origin.

In various historical moments this flow of ideas and persons has multiplied contacts between different cultures, thus contributing to integration between the lifestyles, which at first glance seem irreconcilable.

The most important example of the academic culture's transnational character is *belle époque*, when the European products of material and cultural character were influenced by the lifestyles and traditions of the colonies in Africa and Asia. While in other periods they represented the main vector of communication between the political blocks when human relationships were extremely limited. The most evident case is the Cold War era, when despite the existence of walls that obstructed economic relations between the two opposite systems and political contacts were closed in a rigid "friend-enemy" frame, the academic community was able to remain united and to continue to speak a common language, that allowed the ideas of the intellectuals to circulate both inside the Western block and the Soviet one.

Rethinking the university system, which took place in the last decades had not developed by distortion of the old standards of the academic life which prevailed in the XXth century. On the contrary, it signed the reaffirmation and relaunch of a tendency, which spark take its origin from the medieval times. This tendancy is internationalizzation.

The internationalization process has been reaffirmed in 1999 as a fundamental goal of the Bolonian process. In frames of this process it became evident that in XXth century the University should continuously increase its international orientation in order to maintain its historical role as a privileged channel of the formation process of ideas, which leads to a highly specialized professional world. First of all the academic debate, second of all the scientific activity of the professors, and finally the contacts and experiences that the students obtain during their university carrier. But not only. Since the end of 90's, the in-

ternationalization of the University system has been rethought by politicians that started to consider it a powerful tool in constructing a common European identity. In frames of the so-called European Space of High Education this ultimate goal has been achieved by implementing some structural reforms, such as introduction of comprehensible degrees; transparency of study programs; introduction of the credit system, based on the workload and the learning results; by diploma supplement; degree and study period recognition; a common approach to the quality assurance and implementation of the common degree framework for the European Space of Higher Education.

Even though the very presence of homogeneous valuation criteria is very important in the study process of young people, the development of internationalization cannot be limited to the technical adjustment of "quantitative" character only, but should find its realization in "quality" activities, which each University conducts. This depends on the the determination and efforts of professors and administration of every university and on their capacity to present themselves as a strong academic community and to create an efficient network with other European and international academic communities throughout the world.

The effort made in this direction has not only contributed to a progressive rooting of the European identity, but has also strengthened the feeling of belonging to a larger community, which is the Eurasian Continent. This very category, which contains Europe and Russia is often erroneously considered to be declining. But contradictory developments in the international dimension, on the contrary, showed that Europe and Russia have not only common interests but also common destinies, which meet continuously. Besides, the central role of these countries on the political scene and the defense of their political and economical models and lifestyles is directly linked to intensification of their cooperation.

In this prospective, the Italian High Education System in general and Sapienza University of Rome in particular have cultivated strong relationships with Russia scientific community, which can be defined as "traditional".

One of the most significant testimonies of this exchange are the

numerous Agreements on students and stuff exchange signed between Sapienza and various Russian Universities. They cover all the disciplines and research fields both in the Humanities and Science spheres. For this reason, as Vice-Rector for International Relations and Cooperation, I did not just support the existing agreements with Universities form Russia but encouraged signing the new ones. All this was done to increase circulation of ideas and persons in the cultural space which, as my experience show, is considered "common" by its participants.

Special Aspects of Instructional Materials Design for Modern Engineering Education

Yury Tsvetkov

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Modern university engineering education is based on deep fundamental background of the mathematics and physics with joint use of technical, economic, management and other disciplines.

Engineering developments and innovations are being brought forward at an increasingly rapid rate, thereby forcing engineering education to adapt to new realities.

As the academic load and duration of training cannot be increased, the volume of the educational information, arriving to the student has enlarged.

It forces to search for more effective methods of training, to be engaged in introduction of new information-communication technologies for the purpose of an intensification of educational process, increase of its efficiency.

Experience of the decision of these problems in Bauman university (Moscow, Russia) allows to allocate in them two basic aspects:

- creation and development at University of a local information-communication infrastructure,
- elaboration and implementation of instructional materials, which efficiency corresponds to possibilities of modern information technology.

Orientation to independent cognitive activity of students is chosen at University as the basic didactic approach with use of specially prepared electronic interactive instructional materials for local or network application.

Elaboration and implementation of complicated multimedia educational complexes is conducted in the program cover simulating the author's environment in which the teacher can independently realize the basic ideas of discipline and organize control of their mastering by students.

Process of creation of substantial and verifying blocks allows to lower the labor of carrying over of available knowledge in the electronic form by using of the designer of courses.

Designing of modern instructional materials on disciplines of engineering education is based on substantive provisions of instructional design.

First of all in instructional materials the goals on which achievement they are focused should be formulated.

The goals of instructional materials correspond to the goals declared in the program of a educational subject, and define the competence of the student.

The maintenance, structure of instructional materials correspond to the declared goals.

Then, the technology of training, the educational activity realized in instructional materials, correspond to the declared goals and provide independent work of the student.

Further the following list of requirements to instructional materials is shown.

Instructional materials use a context of the future professional work of the student. Theoretical data are given for the decision of concrete problems, situations, complex tasks taking into account a professional context.

Instructional materials consider interdisciplinary communications which are important for base competencies formation.

Instructional materials form productive ways of activity which possess property of carrying over and can be used for the decision of other problems, situations, problems in various subject domains.

Instructional materials form skills of informative activity, comprehension of features and laws of process of knowledge.

Instructional materials contain the necessary and sufficient information for formation set of knowledge, abilities, competences.

Modern instructional materials are accompanied by special means in the form of computer software products, interactive training apparatus, multimedia means, etc.

For improvement of intelligibility of difficult professional and educational knowledge, their representation in the form of electronic instructional materials should possess the highest ergonomic quality. Therefore the method of representation of knowledge is used in such a form, as to express of a material by means of an optimum (ergonomic) combination of the verbal text, formulas and drawings.

For increase of ergonomics of instructional materials it is necessary to solve set of various problems and, first of all, to improve intelligibility, to raise clarity of an instructional material, i.e. to raise its ergonomic quality.

It is possible to allocate two methodological principles, defining possibilities of increase of ergonomic quality of instructional materials:

- chunking of the information,
- visualization of the educational information.
- The principle of chunking of an instructional material demands allocation in it of the basic concepts, definitions, educational elements that improves their perception, understanding and storing. Following laws are thus considered:
- the teaching material of great volume is remembered hardly;
- the teaching material located compactly in certain system, is better perceived;
- allocation in a teaching material of semantic strong points promotes effective storing.

Information quantization provides optimum conditions for effective perception of the educational information with the least expenses of mental energy for its comprehension and transformation in comparison with the teaching materials which have been not subjected to quantization.

Visualization of the educational information allows to transform

huge files of the information to visual images adequate for human perception which can vary from detailed graphic representations to abstract structures, counts, schemes, diagrams, etc.

Such structured files of the information represent instructional materials of new generation in which the image and the text incorporate organically, mutually strengthening each other. The basic idea of such materials – to tell thought in unity of an image and the text, proceeding from position that figurative and verbal components of thinking separately not so are strong, as in unity.

Educational and Scientific Infrastructure of the National Research University of Electronic Technology

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Abstract

Main infrastructure changes performed in National Research University of Electronic Technology are observed. Perspectives to increase efficiency of education and research are presented. Integration into international scientific and educational system possibility is discussed.

Keywords: globalization of economics and education, competitiveness of university, effective management.

The establishment of National Research University of Electronic Technology (hereinafter MIET or the University) in 1965 was aimed at providing the national electronic industry with highly qualified specialists. Nowadays it is one of the leading universities in Russia educating professionals for working in the field of High-Tech. Located in Zelenograd, the centre of national electronics with high concentration of industrial enterprises and scientific research institutes, The University enjoys all favourable conditions for beneficial integration of its educational, scientific, research and productive activities. Profound basic education combined with significant volume of practical training at enterprises, participation of the staff in particular scientific research projects and attracting industry and science professionals to educatio-

nal activities, all these allow to develop new courses, programmes and curricula, write new books and tutorials on nano – and microelectronics and transfer up-to-date knowledge to students timely and quickly.

For the time of its existence, the University has educated 27 thousand engineers, 1400 doctors and candidates of science thereby providing staff support for enterprises of electronic industry in many regions of Russia. Today MIET graduates make up the personnel and research basis of many enterprises in national electronics.

In order to rebound the competitiveness of national electronics industry it is necessary to develop university complexes that managed to preserve their high educational and scientific potential, developed up-to-date infrastructure for designing world-class innovative products and that are capable of taking the leadership both in education and in research and innovative activities.

Thus, the mission of MIET is in its further development as innovative environment for training highly qualified staff, generating and transferring new knowledge into technologies and electronic devices for the needs of national high-tech industries and social sphere.

On the research market, MIET concentrates on applied research and developments in the following fields:

- electronics (including micro – and nanoelectronics, radio-electronic engineering, micromechanics and robotics, biomedical complexes and/or systems);
- IT-based technologies (including computing systems, software, information and control systems).

In accordance with the terminology of QS and THE rating systems, these fields correspond to the following terms: Engineering & Technology, Electrical and Electronics Engineering, Computer Science, Computer Science and Information Systems.

Progress in the mentioned fields is based on the realization of the following projects:

In 2002, MIET opened "MIET-Cadence Device and System Design Institute", launched together with company Cadence Design Systems to train highly skilled personnel in the field of designing and developing analog and mixed ULSI as well as systems-on-chip.

In 2003, within the framework of agreement with Synopsys company MIET started up Education and Research Center called "Center for Technological Simulation of Semiconductor Structures TCAD".

In 2004, in MIET there was established research equipment shared-use centre "Microsystems technology and electronic component base" supporting complex development of priority fields of science, engineering and technology.

In 2005, MIET and Mentor Graphics set up "Education Center for Device and System Design" to train specialists and masters within the framework of their agreement.

In 2005, MIET Innovation Centre joined Free Economic Zone "Zelenograd".

In 2006, MIET came into the top list of 17 higher education institutions, winners of national priority project "Education", implementing innovation educational programmes.

In 2008, MIET got the status of the head organisation in "Nanotechnology" within the framework of Federal Programme «Development of Russian nanoindustry infrastructure» up to 2015.

In 2010, The University was granted the status of "National Research University".

In 2010, in order to generate and support new businesses in the field of nano – and microelectronics MIET together with Zelenograd Innovation Technological Centre and state corporation Rusnano established Zelenograd Nano-Technological Centre.

In 2012, MIET participated in organizing Innovation Territorial Cluster «Zelenograd» and took the lead in developing the system of target staff training and establishing Youth Innovation Centre.

With systematic approach to supplying its laboratories with up-to-date and unique equipment for design and production of electronic devices within the past several years the University has created Hi-Tech industrial cluster MIET comprising a stable group of enterprises and organisations, the partners of the University, which function in fast developing sectors of the global electronic market. The partners use

the potential of the University (graduates, specialists for R&D activities, scientific and technological as well as innovative infrastructure of the University) so as to make competitive hi-tech highly commercialized products. With modern scientific and innovative infrastructure, the University covers all basic stages of competitive electronic production in terms of scientific and innovative developments: from designing and creating microelectronic element base (integrated circuits, micro – and nanosystems) to designing and creating special radio electronic gear and equipment for hi-tech industries and social sphere.

At present along with fundamental and innovative research activities MIET is developing closer cooperation with both Russian and foreign partners. The share of income from R&D activities in the total income accounts for more than 40%. The financial stability of the university is highly dependent on the efficiency of research work, which makes it necessary to boost R&D financing from business circles, since raw material orientation of the economy may bring about significant cuts in financing science within the framework of budget allocations, public funds grants and federal programmes.

Regarding the university entrants market MIET is focused on Russia, the CIS, Central and Eastern Europe, South Eastern and Central Asia and the Middle East countries. As an extra means of attracting gifted students the University organizes special vocational guidance conferences, contests, competitions and provides grants. MIET has a special program for increase in number of children's and youth scientific and technical projects, competitive nationally and globally in the format of international young researchers schools.

The university is experienced in creating target staff training system for enterprises of national electronic industry. The training system is based on the network of 20 MIET-based research centers organized by electronics and IT-industry leading companies such as Cadence, Synopsys, Mentor Graphics, Hewlett-Packard, Cisco, Microsoft and others. That enables us to promptly acquire and apply state-of-the-art innovations in studies as well as in organizing practical training of future graduates.

With advanced software and equipment, MIET provides superb educational training and retraining in various fields. The University al-

so holds developed experimental and production facilities. These factors enable us to state that MIET has a great potential in developing and producing analog-digital VLSI, nanosystem components and MEMS, mobile telecommunication mobile systems for various purposes, robotics devices as well as equipment, machines and special materials for medicine and bioengineering.

E-LEARNING EDUCATIONAL PROGRAMM FOR PROFESSIONAL CERTIFICATION IN THE FIELD OF RUSSIAN NANOELECTRONICS

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Abstract

The educational resource designed in the e-learning format is intended for nanoindustry specialists self-training for «Production of nanoscale semiconductor devices and integrated circuits with nanotechnology» professional standard certification in compliance with qualification level 7.1 – the process engineer. The resource includes 8 modules equipped with educational-methodical complex in SCORM-compatible format. National Research University of Electronic Technology (MIET) developed this resource requested by the Fund of infrastructure and educational programs of JSC «RUSNANO».

Keywords: nanoindustry, professional standards, specialists training, assessment and certification of qualifications, educational resource, e-learning format, Fund of infrastructure and educational programs of JSC «RUSNANO».

Currently elimination of the lag in the sector of high-tech industries, particularly in nanoelectronics is a condition of Russian innovative economy becoming. One of the main ways for solving of this problem is the preparing of highly qualified personnel for this branch, with high level of competence corresponding to international requirements.

High rates of nanoelectronics development produce specific requirements for the content and implementation procedures of educational programs for various levels of training. These programs should take into account the particularity and dynamics of modern nanoelectronics productions.

The transition to 90 nm design rules or less in the field of modern IC's manufacturing is characterized by increasing complexity of the process technology. Also a range of special factors must be considered in the design and manufacture. The features of modern nanoelectronic manufacturing should be taken into consideration for the purposes of determining the structure and content of educational programs.

The developed educational resource designed for nanoindustry specialists self-training for the procedure of the qualification assessment and certification in accordance with the professional standard «Production of nanoscale semiconductor devices and integrated circuits using nanotechnology». The solution of the qualification assessment and certification problem is a necessary condition for the formation of the market of qualified specialists in the field of nanoindustry. A characteristic property of the development of this market is the transition to the introduction of professional standards in key areas of professional activity and the corresponding changes of labor legislation.

Professional standard plays a key role in the solving of such problems as assessment and certification of qualifications of workers and graduates of universities, the development of systematic approaches to the HR management of the enterprise, the enterprise regulations in the field of personnel management. Another group of problems is related to the development of national educational standards and professional education programs, as well as standardization and unification within economic activity, regulatining of work activities.

Professional standards settle requirements for professional competence of specialists and the criteria for their assessment through the contents of job functions associated with each qualification level in the professional field. It provides a move of vocational education to a new level, and a reconstruction of the effective interaction of education and professional communities. In turn, educational institutions will receive clear guidance that is necessary now for developing relevant educational programs and training areas, and for assessment of the graduates preparedness level for professional work. JSC «RUSNANO» is very active in the development of professional standards for the nanotechnology industry. In the field of nanoelectronics, this work is being done with the active participation of the National Research University «MIET».

Both businesses and professionals are interested in creating of a reliable professional certification system. It could serve as a prerequisite demand for educational resources to ensure the practical realization of such a system. The features of the territorial distribution of production enterprises and potential human resources make it necessary to use in this case distance learning as a basic principle of its implementation, which corresponds to the global trends in education.

Goal of the developed educational resource in e-learning format is a self-training for certification requirements of professional standard «Production of nanoscale semiconductor devices and integrated circuits using nanotechnology» for the qualifying level 7.1 – production engineer. National Research University of Electronic Technology (MIET) developed this resource requested by the Fund of infrastructure and educational programs of JSC «RUSNANO».

For qualification level 7.1 of the National Qualifications Framework main type of work in this area is supporting and integration of semiconductor manufacturing processes using nanotechnology.

Educational resource designed taking into consideration the labor functions defined according to professional standard, including issues related to the creation of modern technological features of IC and systems on a chip, and contains eight of electronic modules for self-training:

– Vacuum and plasma processes for nanoelectronics;
– Nanolithography technology;
– Dielectrics for nanoelectronics;
– Silicon implantation technology for nanoelectronics;
– Metallization for nanoelectronic circuit fabrication;
– In-process and final control methods for micro – and nanostructures;
– Quality and yield management for nanoelectronics;
– Nanoscale CMOS and BiCMOS manufacturing processes.

Modules include an interactive educational-methodical complex in SCORM-compatible format and cover all major issues related to the field of professional activity, namely, with the area of production of nanoscale semiconductor devices and integrated circuits using nanotechnology. Each module is represented as a separate educational resource. Assembling of modules was realized by means of the editor CourseLab, certified for compatibility with SCORM – 2004. Web Tutor platform was used for the resource placement in the Internet.

Contents of educational-methodical complex include:

- lectures presented in a video format;
- video fragments;
- presentations;
- virtual labs with elements of permit and defence of the work done;
- reading-book;
- test assignments;
- project tasks;
- practical training;
- guide to study of the module;
- reference materials;
- glossary.

Specialists self-training with use of the proposed educational resource is intended for the achievement of the main goal in this area of professional activity: the ensuring of the full semiconductor crystals production cycle, the development and introduction of new technological processes used in the production of nanoscale integrated circuits.

Perspectives of the Development of Distance Education in Russia

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Abstract

In this article author investigates features of the development of distance education in Russia, determined the factors of the popularization distance technologies and the prospects of development of e-learning in Russia.

Keywords: distance education, distance technologies, Internet, Ministry of Education of Russian Federation, effective and continuing education, financial literacy, Fund of the people opinion, education and science, market of educational services.

Distance education in Russia is growing rapidly, almost every institution tries to inject the remote technology to expand its educational programs, both in Russia and abroad. Despite the fact that e-learning has not yet reached a high level in both America and Europe, however, and the country's leadership in education, and heads of educational institutions are making big bets on distance education. Russian President Vladimir Putin emphasized the importance of development e-learning in Russia.

According to research by the World Economic Forum, Russia is in 71th place (out of 75 countries in total) on the use of new technologies in education. Experts point out that there is still no more than 15% of the educational market accounts for distance learning, although other studies suggest that the format of learning sometimes

effective habitual forms of education: higher speed memory material by 15-20%, and at the same time receive training requires 35-40% less[1].

At present the development of regulatory documents to the Federal Law of 29.12.2012 N 273-FZ (as amended on 02.03.2014) "About Education in the Russian Federation", specifying particular educational programs using distance technologies.

Especially noteworthy the fact that e-learning system is implemented not only in educational institutions at various levels, but also in companies and government agencies (see. diagram 1).

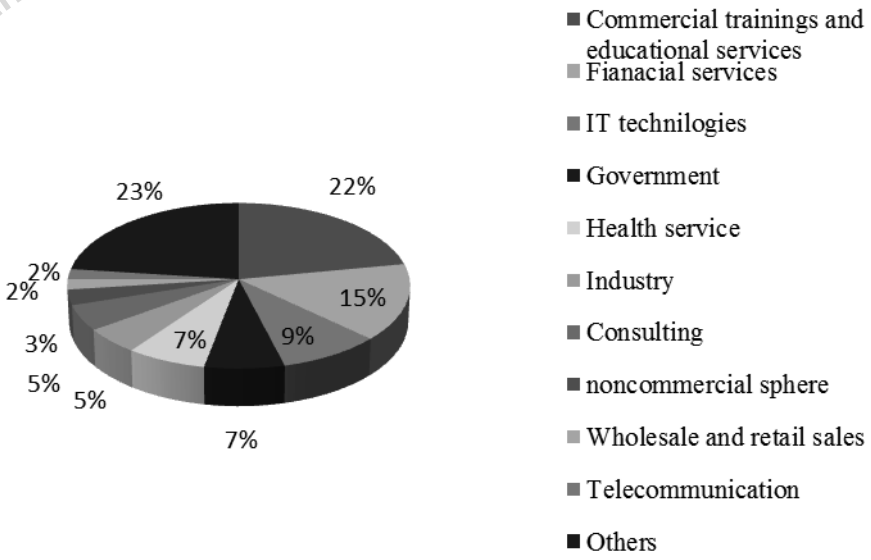

Diagram 1. Spread of distance technologies in various areas.
Sources: www.compress.ru. Shlyhtina S.
"Perspectives of the development distance education in the world and in Russia"

Factors that cause of the development of distance technology:

– The willingness of people to educate themselves, due to the high demands of the labor market;

[1] http://www.kp.ru/guide/distantsionnoe-obuchenie.html "What does it give the university tuition by distant and how much does it cost? (The official link of the newspaper "Komsomolskaya Pravda").

– Rapid pace of scientific and technological progress;
– The convenience and efficiency of application of remote technology;
– Training anywhere in the world;
– The possibility of combining work and studying;
– The desire to get a double degree students studying in parallel in Russian and foreign university partner with minimal costs.
– Etc.

An example of that distance education is popular in Russia, is a growth quantity of students at the Faculty of distance learning in Plekhanov Russian University of Economics from 30 people in 1998 to 2,800 in 2014.

Of course, discussions on the necessity and usefulness of e-learning much there, both supporters and opponents of e-learning. However, Internet, no matter how desirable, at present, is one of the first sources of information that is accessed by people of all ages around the world. In this regard, its prospects lie on the surface of the problem.

1) According to the Ministry of Education and Science of the Russian Federation, 450 thousand children with disabilities study at schools, but only 15 thousand continue their studies in universities, in this connection it is necessary to construct a continuous vertical and inclusive education for children with disabilities, starting with preschool education to higher education.
2) Improving financial competence through the development of remote technologies;
3) Expanding the range of training programs and training for different groups of areas and specialties that will allow the student, without going outside of Russia to acquire new knowledge and develop the skills previously obtained by studying in educational institutions and centers abroad.
4) Increasing the number of students in higher education institutions in the regions.
5) The internationalization of Russian education.

In conclusion I would like to note that when interviewing people about the importance and necessity of using remote technology for

learning and acquiring new knowledge and skills, opinions were divided. This is due to the fact that there are two categories of people. First – at least a few times to use the remote technology. Second – never use distance technology in studying. As a result, the survey indicated categories showed that the students do not mind internally, use remote control technology in the learning process, furthermore, for example, the availability of electronic textbooks in any place and at any time one of the highlighted benefits.

Thus, e-learning in Russia has a great future, but for their development and widespread use, it is necessary, above all, a solid legislative framework governing the rules, methods and using of distance technology in various organizations.

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NETWORK INTERACTION IN E-LEARNING: THE EXPERIENCE ANALYSIS AND DEVELOPMENT PROSPECTS

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Abstract

In this report the experience of Tomsk State University and the association "Siberian open university" in organization of network interaction in e-learning is presented. The model of the network distributed structure of professional skill improvement of the scientific and pedagogical personnel created on basis of leading higher schools of Russia is described. E-learning and distance technologies are considered as the factors promoting development of network interaction.

Keywords: e-learning, network interaction, distance technologies, educational programs

The modern society development is characterized by processes of globalization, expansion of national economies interaction, social systems, science and education, the processes reflecting specificity of transition to knowledge society, connected with certain correction of trends of strategic country development and improvement of educational paradigm.

The process of Russia integration into international educational environment becomes obvious and inevitable. It brings up to date the problem of establishment of the system of higher schools network interaction providing information and consulting mutual aid of universi-

ties for encouraging their participation in integration processes within the education field. The network interaction in this case we consider as the interaction of autonomous subjects on voluntary basis who take part in general problem solution, have available material for joint activity, necessary technical support, and possibility of use of telecommunication networks in interactive mode. As the basic properties of network interaction we recognize the uniform interaction environment, multitude of interdisciplinary communications, nonlinear mode of interaction, and an open form of information exchange with the environment.

The drawback in network interaction development is caused by variety of problems and fast change of external operating conditions of networks, possibility of solving problems with various effectiveness, mixture of network interaction variants which take place in development of problems of inter-regional and inter-university interaction, project approach to elaboration of co-programs, inside-university interaction of groups and project teams.

The development of e-learning and virtual mobility is considered to be effective trends of network interaction of education institutions [1]. In the conditions of prompt development of information and communications technologies the concept of network and network interaction as the basis of educational environment providing the equal rights and possibilities of network members is most completely implemented: research and education institutions, teachers and students.

In order to encourage higher educational institutions to exchange their contents, technologies and transition to network interaction, in autumn 2013 the Ministry of Science of Russia carried out the monitoring of level of e-learning in Russian universities, which showed that the awareness of education institutions of mass introduction of e-learning was insufficient, and the development of network interaction was hampered by isolation of higher schools, absence of conditions for electronic educational environment operation and scanty level of attainment of staves.

The higher schools interaction in the field of e-learning demands an umbrella approach to normative documents, electronic training resources, as well as decision of various personnel, organizational, tech-

nical, technological, financial problems. However, the question of budgetary funds distribution in realization of network educational programs is left open.

The analysis of Russian experience in organization of network structures, network interaction development and realization of joint educational programs shows that the most effective mechanisms of network interaction have been developed by participants of the association "Siberian open university" which unites more than 40 establishments of Russia and the Republic of Kazakhstan [2]. The association activity has promoted the creation of model of open education institution which makes it possible to integrate research and pedagogic potential and educational resources continuing the traditions and specifics of certain educational environment in order to improve the efficiency and quality of education. Such experience exists in other countries, for example, in the UK [3].

The principles and mechanisms of joint research and education activity of higher schools in distance education system were proved in 2002. It was offered to create inter-regional university complexes based on associative model of education institution. The main point of the model consisted in the arrangement of joint programs by the participants of the association, due to which the branch of association and the branches of universities should have been opened. The universities were supposed to enter into the agreement with the association which co-ordinates the curricula of all higher schools-participants through its branch combining general courses for various majors, employing teachers from different universities. Consequently the universities could involve highly skilled specialists and professors, and the students participating in the experiment could have an opportunity to be trained by the best teachers at any of the universities-participants.

The establishment of inter-regional university complexes was confronted by the problem of absence of legislative base for network interaction and joint activity on basis of distance education as well as by apprehension of some higher schools to have strong competitors in the partners of the association in their region. The absence of law regulating the status, principles and technologies of e-learning made the task more complicated. In 2004 the new stage in the organization

of joint educational programs of the association started. It was connected with the organization of joint distance courses and involvement of personnel potential of association participants.

The essential experience of network interaction of Russian education institutions has been accumulated by National research Tomsk State University (TSU) in the framework of some theoretical and practical projects realization within 2008-2013. We have elaborated the model of the network distributed structure of refresher training for higher school teachers and researchers. It is based on modern information technology application and it contains all basic elements of common educational environment including the infrastructure of the resource centers and institutions, entry system to educational resources, support and management of educational process, monitoring of training quality, a set of consistent programs, and also organizational, technological and personnel maintenance.

The network partnership being formed within the model can promote the creation of common supporting infrastructure (resource centers, centers of multiple-access etc.), the general services (vocational guidance, intake of students, united library) and network educational programs (student's exchanges, applied baccalaureate, joint postgraduate course, training courses).

The developed model of network interaction can be realized in centralized and decentralized forms. The "centralized" means working out an educational program by one institution whose realization can be implemented by teachers of other higher schools (under the contract or on terms of combine job). Universities can make an association agreement with the condition to assist the development of network interaction.

The "decentralized" form is based on joint working out and realization of programs by two or more higher schools. Thus the student has freedom in his choice of modules and universities to study. Having completed certain modules and got a credit for each of them, the student can apply to any university which has the coordinated program, pass the final test and receive the certificate of his skills improvement. This variant is possible only in case of co-program existence (if it is confirmed by each university and is carried out in accordance

with the collaboration agreement). Thereby any of participants of the network can become responsible for educational program within its realization period including the intake term. Such sort of approach implies any higher school participating having the corresponding unique potential and interest to take part in working out and implementation of joint educational programs.

The role of the resource centers created on basis of leading universities is concentrated on coordination of participants' activity of network structure, on the development of new network projects, creation and support of information system of network interaction. Thus, the distributed structure of skills improvement with bases in the form of resource centers becomes self-managing system arranging the time connections for the project problems decision.

The stored knowledge of "Siberian open university" association testifies the efficiency of the co-programs organization on basis of network interaction that results in progress of virtual academic mobility, expansion of common educational environment, and upgrade of distance technologies. The strict adherence to international standards in the field of e-learning and information resources is an important item.

The work results on the development of the network distributed structure of higher schools interaction are of importance for creation of open network of the backbone Russian universities providing mass distribution of best practice and innovative results in higher vocational education system. There are good prospects of the sustainable development of network interaction experience at all educational levels, introduction of results of innovative educational programs, application of new educational technologies and development of in-Russian mobility of students and teachers.

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RUSSIAN MASSIVE OPEN ONLINE COURSES (MOOC): CURRENT STATUS AND PROSPECTS

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Annotation
The paper reviews the Russian experience of development of massive open online courses (MOOC) and provides evidences of priority of the Russian organizations and scientists in creation of the first MOOC in history. The authors analyze the differences between the two main directions of MOOC and draw conclusions about prospects of research development in the area of massive open online courses cMOOC.
Keywords: massive open online courses, MOOC, educational organizations, higher education, universities.

MOOC, massive open online courses, have been one of the world's most significant phenomena in education recently. This abbreviation is so often mentioned in the global and Russian educational space that it scarcely needs any interpretation.

The term Massive Open Online Course was offered by two researchers, Alexander Bryan and Dave Cormier, as a result of working on the Connectivism & Connective Knowledge course held by George Siemens and Stephen Downes in 2008. The general name of this type of courses is made of several terms:

Massive: this course usually involves a large number of participants.

Open (open): the course is free, and anyone can to join it at any time. As a rule, the course uses open source software and free Web 2.0 services.

Online (distant) means that the course materials and the results of the joint work are on open access to participants.

Course: it is supposed to have the proper structure, rules and common goals that can be subsequently transformed for each participant [1, 5].

Though MOOC refers to pedagogical issues, its prospects have been increasingly discussed in social and political aspects recently. Much attention is paid to MOOC in the Ministry of Education and Science of the Russian Federation.

Perhaps no one would argue against the basic mission of MOOC, which is to create new training courses by joining efforts of the best representatives of the international educational community and make them available to anyone interested in any part of the world. The relevance and reliability of the MOOC projects is strengthened by involvement of Stanford, Harvard, MIT and other world-renowned universities [4].

Exciting public speeches at the TED conference considerably increase the number of MOOC's advocates and the number of attempts to develop new courses [2, 3, 6].

To understand the correlation of the pedagogical science and business in the MOOC problem, it is appropriate to consider some historical facts.

MOOC first appeared in 2008. In 2011, Thrun and Norvig at Stanford University successfully conducted a free online course on artificial intelligence. Thrun's students were 160,000 people from 190 countries.

What results from this information? In 2008, Downs and Siemens provided experimental online training based on the connectivist theory, without thinking of money, which is typical of most true scientists and educators. In 2011, the media business became interested in this direction in education, and the result exceeded all expectations. In

2011, professor Thrun provided courses on artificial intelligence to more students than in the previous 20 years of his teaching activities.

Let us hasten to pay attention to the fact that MOOC can be conditionally divided into two classes, namely cMOOC and xMOOC. To put it simply, we can say that the difference is that xMOOC copies (imitates) the activities of full-time teaching in the Internet environment. For example, the main types of studying activities in xMOOC are lectures, seminars, tasks for independent work, etc. The author of the course makes the program and defines the training objectives and results. Of course, xMOOC implies certain pedagogical features, which we will discuss later, but in general, it is a mold of traditional full-time training. That is why Coursera and many other MOOC projects constantly discussed nowadays, strictly speaking, are not pedagogical innovation.

Meanwhile, cMOOC is another matter. It is quite unusual and differs from what is characteristic of a traditional full-time teaching process. In cMOOC, the students themselves (rather than the teachers) set the learning objectives and plan the individual learning trajectory. Students' joint activities are necessarily accompanied by creation of a new educational product that may have been unknown even to the teacher. To understand the connectivism theory, it is necessary to take cMOOC first. The authors know such courses in the post-Soviet area held by V. N. Kukharenko from Kharkov National University [5] and I. Travkin from Yuzhno-Sakhalinsk University [7].

Answering the question what the fundamental difference between xMOOC and cMOOC is, we can state that xMOOC course can be built in to a traditional full-time learning process, while cMOOC cannot.

From now on, our discussion will mostly relate to xMOOC. Let us specify the basic indicators of xMOOC.

1. Tuition is free and voluntary.
2. A large number of students enrolled (hundreds and thousands).
3. Interaction is mainly done via Internet services (video, forums, mail, etc.).
4. Types of studying activities are lectures, assignments, tests, etc.
5. Focus on independent work, self-control and mutual control.

What is the current state of affairs with MOOC in Russia?

One of the oldest MOOC in Russia is the System of Distance Business Education SMB (SDBO) (www.businesslearning.ru). This system provides an opportunity to improve the skills in the field of entrepreneurship for free, at any time, in any place where there is an Internet connection. This is a joint project of Alliance Media National Business Partnership (www.allmedia.ru) and LINK International Institute of Management (www.ou-link.ru) created in 2000 with the support of the Government of Moscow.

The project has been of great social and economic value, since a change in the economic situation has led to the emergence and development of new forms of entrepreneurship. The knowledge gained ten or even five years ago is insufficient for effective business dealing. A successful entrepreneur must be expert not only in the relevant area, but also in financing, management, psychology and marketing. That being said, businessmen more and more often begin to think of further education what SDBO provides in 104 modules on Business Fundamentals, Strategy for Business, Competitiveness, Economics, Management, Human Resources Management, Practice of Entrepreneurship, Law, Marketing, Finance, Accounting and Taxes, Security, Fundamentals of Humanitarian Knowledge.

The courses give the latest knowledge in the area of business management in market conditions, allow to master the skills of financial analysis, to learn to predict the development of business and to respond adequately to changes in the external and internal environment. The modular principle of the organization of training provides an opportunity to select the desired course and a set of modules independently. Tests included in the module structure, allow to pass distance attestation.

Currently, SDBO counts more than 135,000 registered users from 3674 cities and 121 countries.

The commonest training procedure (scheme, model) in Russian distance learning is via the Internet. After registration, a student gets free access to educational materials and studies them independently, getting consultation by e-mail if needed. If desired, a student can obtain a certificate, which is possible upon the final on-site control procedure.

We would like to draw your attention to the fact that the program was organized in 2000, 8 years earlier than foreign MOOC.

Another striking example of the Russian priority in the MOOC area is Intuit National Open University. The range of levels of training is amazing: graduate degree, alternative graduate degree, 547 courses of vocational retraining and 173 video courses on multiple programmes. The Nongovernmental Educational Institution Intuit National Open University is an educational project, the main objectives of which are free distribution of knowledge in the World Wide Web and provision of distance education services. The first training course was created by Intuit on 31 January 2003, 5 years earlier than the first foreign MOOC was made.

Several hundreds of courses on computer science, information technology, mathematics, physics, economics, management and other areas of modern knowledge are available on open access on the website of Intuit National Open University.

Book series published by Intuit such as Fundamentals of Information Technology, Fundamentals of Computer Science and Mathematics (together with Lomonosov Moscow State University), Fundamentals of Economics and Management (together with the National Research University Higher School of Economics) combine several hundreds of books and e-books.

Intuit organizes shooting of video courses and lectures at leading universities and in a TV studio. The video library of the project counts several thousands of hours of scientific reports and lectures of famous professors.

The project collaborates with educational institutions; its educational materials are widely used in the educational process in more than 500 universities of the Russian Federation and other countries. The project was frequently awarded in regional and national competitions, including the National Runet Award. The project is one of the most popular educational resources.

Using the best foreign and domestic experience of MOOC projects, another Russian MOOC, universarium.org, made a start in 2014. The project's mission is to provide access to quality education from the best teachers and leading Russian universities to millions of Russian citizens. Objectives of the project are as follows:

1. Creation of a network-based inter-university site providing free encyclopaedic pre-profile training and targeted specialized education to ultimate consumers of educational services.
2. Ensuring dominance of the leading Russian universities in the electronic area of the Russian educational space with the purpose of building and maintaining thinking and motivated staff for the Russian industry and economy.

The main principles of the project realization include the following provisions.

- Open education platform and involvement of the country's leading universities and teachers in the project.
- Affordable and free training within the project.
- Active educational environment and use of modern technologies and methods: video lectures, automated control of knowledge, interactive homework.
- Orienting some courses to specific employers with a possibility of further
  employment.

As regards the educational process, the courses and educational programs provided by Universarium are created together with the best teachers of the country's leading universities involved in the project.

The training is based on the principle of taking successive modules of the education course. The total duration of the course (time of studying) is 7 to 10 weeks depending on the depth and complexity of the program. Each module includes a video lecture, self-study, homework and a test.

Universarium courses are positioned as elements of academic disciplines in the areas of knowledge. A list of Universarium courses is made by the advisory council. As a network-based inter-university site that focuses on the widest target audiences, Universarium performs several social functions:

- Provision of an opportunity to get quality and affordable education to all persons interested.
- Increasing the attractiveness of education.

- Maintenance of the national identity of the Russian educational space.
- Provision of additional opportunities and vocational training to Russian citizens living in remote and inaccessible areas.
- Ensuring access to education to people with disabilities.
- Strengthening the positions of the Russian language as a basic language of communication in the Russian Federation.
- Promotion of the Russian language as one of the leading languages for communication in foreign countries.

As you can see, we have listed the institutional forms of the open distance education. In Russia, however, there are many enthusiasts of this direction outside the institutional boundaries. Among them is Ivan Travkin (http://about.me/ivan.travkin), Lecturer of Mathematics Chair at Yuzhno-Sakhalinsk University, who has developed and implemented cMOOC called Cooperation, Self-organization and Education in the Open World.

Here are the basic organizational and pedagogical parameters of the course that one of the authors (A. A. Andreev) once took:

- Duration: 6 days (5 + 1).
- Every day: video clip from TED + 7 issues for discussion from the teacher.
- Discussion: on Twitter (with links to other sources).
- Last day: post-reflection.
- The a-posteriori analysis and visualization of ideas and learning process are described in detail on ceow13.tumblr.com.

Thus, the article shows the priority of the Russian education in the development of MOOC ideas. Moreover, these projects are developed and implemented both by institutional educational organizations and individual enthusiasts. The latter, by the way, is inherent in the Russian mentality in all areas of science and pedagogy.

At the same time, the Russian education system is ready to use pedagogical achievements of foreign MOOC, the MOOC themselves and participate in promotion of the Russian MOOC to the foreign educational market, like some Russian universities have already done, e.g. the National Research University Higher School of Economics,

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Moscow Institute of Physics and Technology (State University).

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Plenary session

MODERNIZATION OF HIGH EDUCATION: EXPERIENCE OF UNIVERSITIES IN THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) ROLE OF ICT IN ESTABLISHING OF AN INCLUSIVE EDUCATION: THE USE OF OPEN EDUCATIONAL RESOURCES (OER) AND THE MASS OF OPEN DISTANCE LEARNING COURSES (MOOC)

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN TECHNICAL TRAINING

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Abstract

The article deals with urgent problems of use of modern information and communication technologies (ICT) in technical training for students in distance learning of higher schools. The experience of using Web service for training of specialists and bachelors in the Distance Educational Center (CDO) in the National University of Science and Technology "MISiS" (NUST "MISiS") is described. ICT application for management of educational process is shown here.

Keywords: information and communication technologies, distance learning, Web service for training, training of specialists and bachelors in distance learning.

The National University of Science and Technology "MISiS" (MISiS) is one of Russia's leading teaching and research educational centers, being at the forefront in the development of Russia's innovative, knowledge-based economy. The University is working to develop and apply new information and communication educational technologies in a variety of fields and directions as set in the Program of Creation and Development of the University of Science and Technology MISiS 2009-2017 signed and approved by the Russian Government. The Distance Educational Centre offers new extensive e-learning programmes for sufficient training of specialists and bachelors in distance learning.

The changes in the political system and economic structure in Russia and further development of scientific and technical progress demand the constant improvement of professional knowledge and skills of different specialists. Distance learning is an actual component of the concept of lifelong learning. For the first time distance learning appeared in the UK (1840) and the USA (1873). At the Moscow Institute of steel and alloys (MISiS) the training of students by correspondence was held in the middle of the last century and was renewed on the initiative of the rector Y.S. Karabasov in 2000.

Using the experience of MESI, a new case technology in metallurgy, applied informatics and management was carried out at the Distance Learning Department of MISiS in 2000-2004.

Training of specialists in the sphere of metallurgy has led to the creation of MISiS branches in metallurgical centers of Russia and CIS countries (Moldova, Uzbekistan, Tajikistan). Training of a significant number of part-time students caused transformation of Distance Learning Department of MISiS into the Faculty of distance learning (FDO) in 2004. For improving the efficiency and quality of training and reducing its prime cost various distant technologies were in great need. The case technologies should have been transformed into distant educational technologies: e-mail and internet technologies.

E-mail became one of the means of individualization of learning. Students, communicating by e-mail with teachers, can receive answers to questions which arise in the course of training. But e-mail plays only a supplementary role in modern technologies of training. Web service provides students more opportunities. In 2006 the portal concept for training students was developed together with professor Osadchiy V.A. who had got an experience in creating electronic databases. V.A. Osadchiy developed computer shell in Microsoft Visual Studio in C# using the web-programming technologies. It is registered in the Register of the computer programs of the Russian Federation and certified in the USA.

One of the benefits FDO portal is that this portal contains all the necessary information for students in all disciplines for training. The portal contains educational and methodical manuals, questions for tests and exams, tests, tests for self-study mode and control testing in

addition to training courses and homework assignments that have been borrowed from the case technologies.

The progress of educational technology has led to the need to transform information technologies to information and communication technologies in training FDO as rector D.V. Livanov noted in 2008. Since that time all the specialities and directions of training were based on information and communication technologies. All the students got an opportunity to take training materials from a portal of FDO and to send the performed tasks, using means of information exchange on a portal.

In 2009 in accordance with the document of the Ministry of Education of Russian Federation "About the use of distance educational technologies (DOT)" some changes and reorganization with use of the DOT were made in the educational programme of FDO taking into account the DOT on the version of the Ministry.

The system of distance education of MISiS was nominated to participate in creative competition of scientific developments, innovative solutions and programs in the field of higher professional education at the All-Russian forum "Educational environment 2009". The project FDO was among the finalists and was presented to the competitive commission. The members of the commission asked to demonstrate on-line the most complex and unique resources of the system: the lab work on-line, multimedia courses, calculations of technological processes. The project was awarded with two diplomas: Education Agency and the organizers of the exhibitions at All-Russian Exhibition Centre.

In 2010 at the international congress exhibition "GLOBAL EDUCATION – Education without borders" the project "Universal System of Distance Learning for Technical Colleges of Russia" got approval and became the winner of competition of educational projects.

After the Reorganization Plan of the University which took place in 2012 the Faculty of Distance Learning was transformed into the Distance Educational Centre (CDO). Nowadays the Distance Educational Centre develops information and communication technologies in training the following specialties: metallurgy of ferrous and non-ferrous metals, casting of ferrous and non-ferrous metals, metal forming, pressure metal and alloy treatment, technosphere safety, applied informatics. The training of bachelors is conducted in the following

areas: metallurgy, technosphere safety, and nano-electronics, informational systems and technologies, etc.

Distance technologies are realized in educational process in the following way. The student gets access to methodical materials of the semester, curriculum, programs of courses, electronic textbooks and methodical materials at an entrance to the CDO portal. If necessary the student can use built-in library of a portal with a search engine. Individual tasks, tasks for term papers and projects are formed at the request of the student. While fulfilling tasks the student can use online settlement modules. The student directs the fulfilled tasks to his teacher for control on a portal. The teacher if necessary makes comments on the tasks by means of these tools. The student fulfills online laboratory works, some of them contain the video record, the others – animation. While testing the results are automatically fixed in magazines of teachers.

Information and communication technologies are also used in the work of management of CDO. Methodics service of CDO communicates on a portal with students by information files. Control of progress is kept by means of e-journal and an educational card of the student. At the end of the course of training the student's diploma supplement is automatically formed. Management staff of CDO can take control of users' visits and the fulfillment of tasks on the portal.

Realization of information and communication technologies in distance learning provides opportunities to improve the efficiency, quality and comfort of the educational process for all participants.

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THE STRATEGY OF SAPIENZA ABOUT MOOC

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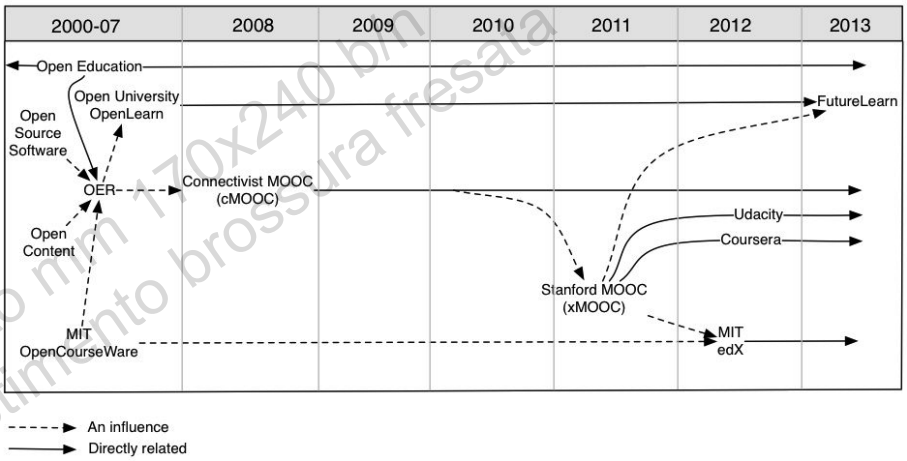
E-Learning in Sapienza

- Sapienza is a big user of Moodle (new version 2): more than 1000 courses and 70.000 students.
- Blended Learning – formal education program in which a student learns at least in part through online delivery of content, with some element of student control over time, place, path or pace, and where classroom methods are combined with computer-mediated activities.
- Continuous education
- MOOC (very recently)

MOOC: Massive Open Online Course

- MOOC: online course aiming at large-scale interactive participation and open access via the web.
- In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for the students, professors, and TAs.
- Usually, the participation at a MOOC is free of charge, and does not grant any formal certification.
- In the Fall 2011 Stanford University offered a free post-graduate course on Artificial Intelligence, attended by about 160.000 students from 190 countries. Since then, MOOCs are gaining more and more attention at global scale.

MOOC: the main actors



MOOC at La Sapienza

At the beginning of the last Academic Year (November 2012) La Sapienza decided to carry out an experience in MOOC, with multiple goals in mind:

1. To fulfill one of the institutional duties of a public university, namely to spread culture and scientific knowledge, both at local and at global scale.
2. To show research and teaching excellence that are present at La Sapienza in various areas and disciplines.
3. To experiment a new teaching models, taking into account the experience that our university already has in distance learning and e-learning.
4. To stay tuned with the new era of MOOC, and try to understand potential benefits and limits and, more generally, to govern their objectives and processes.

The experimentation is carried out by a working group constituted by: a coordinator (Maurizio Lenzerini, professor in Computer Science and Engineering); an expert in learning technologies (Donatella Cesareni, professor in Pedagogy); various experts in e-learning systems and tools (Claudio Napoleoni, Riccardo Trotti – Infosapienza); three professors for teaching the first three MOOCs offered by La Sapienza Carlo Cosmelli – Physics, Francesco Paolo Fiore – Architec-

ture, Paolo Matthiae – Archeology), plus their Tas; people from administration (Graziella Gaglione).

Our strategy:

- Courses in English on subjects regarding the Italian culture and heritage
- Courses in Italian on other areas which might be of great interest to the Italian people.

Coursera

Coursera is a start-up of Stanford University, founded by two Computer Science professors, Daphne Koller, and Andrew Ng. Coursera started its activites by cooperating with Stanford University, the University of Michigan, Princeton University, and the University of Pennsylvania. Then, it started a collaboration with other prestigeous universities:

- 12 partners in July 2012
- 17 partners in September 2012
- 29 partners in February 2013 (including la Sapienza, the only Italian University up to now)
- 108 partners in March 2013

Business model: the contract between Coursera and participating universities contains a list of ways to generate revenue, including verified certification fees, introducing students to potential employers and recruiters (with student consent), sponsorships, etc.

In September 2013 Coursera announced it had earned $1 million in revenue through verified certificates that authenticate successful course completion.

As of December 2013 the company had raised $85 million in venture capital.

The three Sapienza courses of 2013/2014

- Recovering the Humankind Past and Saving the Universal Heritage – Prof. Paolo Matthiae (currently, about 3000 enrolled)

  The course will present Archaeology as the discipline whose objective is the recovery and revival of humankind past, and whose

aim is the rescue and preservation of cultural heritage.

- Early Renaissance Architecture in Italy: from Alberti to Bramante – Prof. Francesco Paolo Fiore (currently, about 9000 enrolled)

  Through some of the most celebrated examples of the early Renaissance architecture and theories, the course will examine problems of the architectural spaces, technology and forms looking to the antiquity in the XV century in Italy.
- La visione del mondo della Relatività e della Meccanica Quantistica – Prof. Carlo Cosmelli (currently, about 4000 enrolled)

  Il corso illustrerà come la fisica del XX secolo, con le teorie della relatività e della meccanica quantistica, ha cambiato radicalmente la visione del mondo che ci circonda.

The near future

- What we have learned:
- Preparing and offering a MOOC is a huge effort
- Project management is of paramount importance
- Great excitement for courses in Italian
- We need to put attention on budget issues
- Great potential for:
- Pedagogical innovation
- Making use of class data (data analytics)
- Using MOOC on campus: blended learning and beyond (sapienza.coursera.org)

Near future:

- Explore the possibility of a specialization offered by La Sapienza
- Other possibile collaborations (besides Coursera)
- Coordinate with other universities
- Monitor the MOOC revolution, especially for better understanding the implication that this new form of education might have on universities (in particular, public universities)

Information and Communication Technologies as a Tool to Develop the Interactive Component of Senior Students' Learning Experience

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Abstract

The report presents the use of information technologies that enable students to improve their creative skills and abilities. Competent application of opportunities of rapidly developing electronic means of communication with the help of partner universities in order to allow students to estimate their developments from different perspectives is proposed. The possible sources and destinations of information flows that optimize the learning experience are considered.

Keywords: learning experience, outside perspective, information flows, partner universities, scientific school, object of research, communication technologies.

Integration of modern electronic technologies into educational process is very active nowadays and due to this fact it is complicated to overestimate the opportunities offered for developers of educational programs. At the same time, there is a clear need to assess the applicability of these technologies in various types and forms of studying process. An understanding of how the introduction of new technology meets the goals and objectives of the studying process and, above all, how they affect the quality of education is required. A varie-

ty of types and forms of education as well as huge opportunities of IT technologies hardly allow to find the universal solution to the task stated above. Therefore within this work we will consider only some options of the possible solutions which specifics are directly connected with Bauman Moscow State Technical University (BMSTU) profile – classical technical university. Educational process at University traditionally assumes a combination of studying basic fundamental engineering disciplines with extensive and versatile practice of students in carrying out their independent developments.

Curricula of the majority of BMSTU students contain considerable amount of the independent project work. The main task of this part of educational process is to form students' skills to apply the knowledge acquired in the process of studying of engineering disciplines in order to achieve the main goal – capability to make the analysis of perfection of design decisions from the point of the ensuring set consumer qualities.

Students, carrying out the development of the object, must learn to perform the work based on their understanding that the proposed solution must meet a list of demands, among which are a few basic, for example, the following:

1. The solution should provide the maximum range of consumer demands;
2. Decisions should be based on real production technology;
3. To ensure the rationality of correlation "price-quality";
4. To suggest the possibility of modernization of the proposed solutions as a reaction to changing market conditions and the improvement of production technology.

This list, especially if it is considered in detail, speaks about the complexity of taking into account all the requirements. Mastering graduate's ability "to see" constantly such lists of conditions, restrictions and requirements in many respects defines the quality of preparation. Such students' skills and abilities to estimate their developments from various perspectives should be shaped consistently throughout the learning experience. This methodological problem is known but its decision has been recently complicated by progressively increasing

amount of information. Objectively there is a problem of introduction in educational process of the technologies that enable students to cope with a problem of finding rational engineering decisions taking into account the growing amount of information. In this aspect, educational programs such as «Industrial design» are especially evident as they assume studying a complex of engineering and humanitarian disciplines such as art history, chromatics, painting and to that similar.

Competent application of opportunities of rapidly developing electronic means of communication as experience of our University shows, allows to optimize the decision of a task considered above.

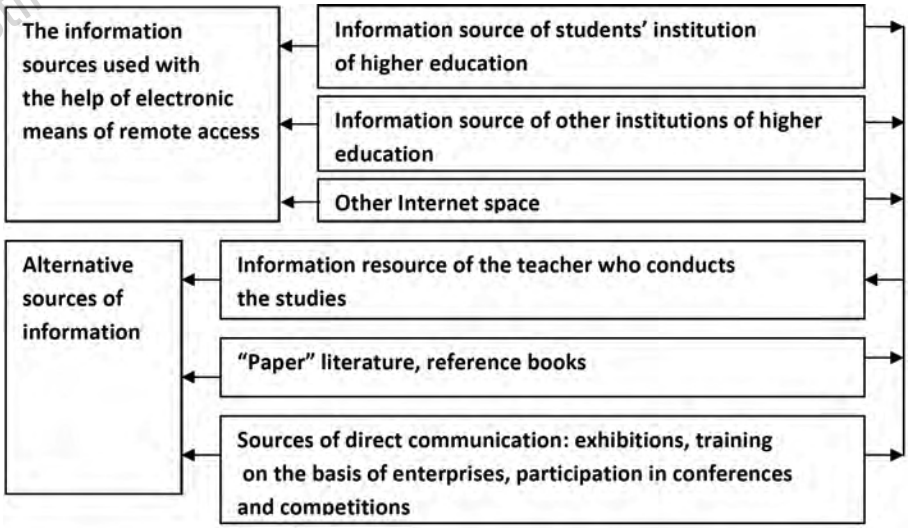

Figure 1.

Figure 1 schematically shows the possible sources and destinations of information flows. The professor, who directly supervises the practical work of the student, must perform a very important function – a kind of filter of extensive information that a student may obtain by using the presented on Fig. 1 sources. It is a process of direct communication with the professor as an opponent largely teaches the student the correct analysis of information that is available via different sources and the ability to navigate in this space. This optimizes the learning experience and reduces the possibility of making mistakes.

Having said that, we propose to strengthen the role of direct

communication, relying on electronic technologies of remote access. Moreover, due to the electronic means of communication, there are no contradictions between the notions of «direct communication» and «remote access». The proposal is submitted to the Fig. 2. that illustrates a branch of information exchange which is parallel with the professor.

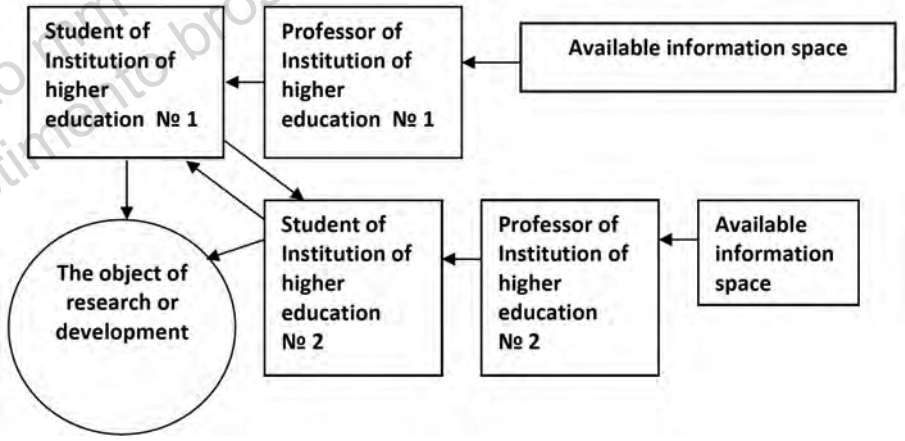

Figure 2.

The following examples are some types of educational process for which application of such diagram (Fig.2) is appropriate.

First of all, it is the creative component of educational process consisting in independent design by the student of any products. Students of close specialities of two institutions of higher education are offered to simultaneously develop the same theme-based projects agreed in advance by the partner universities and supervised by professors of their own institutions.

Obviously, the final version of a development in one way or another will always have signs of scientific schools of the University and mentality of students and professors as citizens of their country. In addition, even the amount of information and principles of its analysis at pre-design stage will be different. And this is very important! If during the final stage of the work give the students an opportunity to discuss their own decisions and decisions of students of partner universities, this may significantly complete their understanding of the design process.

As another example, we will consider the possibilities of the use of technologies of electronic communication in preparing students for "Industrial design". The choice of this direction of preparation as an example is explained only by the fact that purpose and specificity of development objects of industrial designers are understood by a wide range of people in contrast to developments in more specific areas of engineering and technology. The program of training in this area contains a number of disciplines, from which it is easy to understand the new opportunities in the educational process. For instance, part of the discipline "History of design" can be held for students of both partner universities by the professor of one of them, and another part of the discipline – by professors of the other. In principle, the new thing is that the students of different universities, staying at "home", will have the opportunity to broaden their vision of the subject due to the involvement of information about another scientific school and different mentality into the educational process. Both examples have in common is that in both cases the remote groups of students get an opportunity of real professional communication.

Such technology in our University has already received a special name – "Outside perspective". We believe that its most important advantage is the possibility of a targeted use of modern means of electronic communication in the preparation of students of institutions of higher education, aimed at developing new facilities and technologies that require the skills of problem solving, satisfying a wide range of consumer and technological requirements.

Russian Master Degree Program Students' Research Work Specifics

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Abstract

A multi-level higher education system was introduced in Russia in 2011. The future professionals can either opt for obtaining an undergraduate degree or they can pursue a master degree. The key focus is placed upon the applicability of the knowledge acquired, with a significant proportion of research work being done by the students during research seminars, in the course of research conference presentation preparation, and in the course of publication preparation. The transition to the multi-level higher education system, while posing serious challenges, is of paramount importance for training highly qualified personnel, that is, PhD and doctoral degree holders. This article is dedicated to examining the teaching process structuring forms and methods and research work and academic supervision formats and methods used at the master training departments.

Keywords: master degree program, research, research seminar, partner approach to education, interactive approaches to teaching.

All the master programs are usually divided into purely theoretical and practice-oriented ones. This is in line with the international practices where the research-oriented programs lead to a Master of Science degree and the practice-oriented programs lead to a Master of Arts degree. However, we can observe a somewhat different situation in Rus-

sia today. Not only have those who want to devote themselves to research have been enrolling into the master training departments. What is more, in the majority of universities, students have entered into the master training departments to obtain specialized knowledge needed to do the practical work. They often consider their future master degree as a certificate of their second tertiary education. Whether or not the students achieve their individual goals when studying at the master training departments largely depends on whether the master program was chosen correctly. Universities develop the master program content in line with the labor market requirements while taking into consideration the necessity to train research personnel and qualified teaching staff. Excessively specialized master programs have their downside as the graduates need to acquire new knowledge after merely changing an employer within the same professional field. One of the ways to resolving this issue might be the launch of the interfaculty master programs and interdisciplinary programs in economics and law, economics and management, management and applied computer science, etc. Perhaps the new federal higher education standards will facilitate doing this in the near future.

We realize that we need to provide special research-based training to the master program students, and it is natural that the question arises about how we can do it. Let us examine the basic curriculum of a master degree program in economics. It has general educational, research and practical training components.

The general educational part consists of two cycles of disciplines. The educational component that accounts for 50 to 70 credits of the overall master program student workload is 120 credits worth. Out of those 50 to 70 credits, 10 to 15 credits are required to obtain while mastering the disciplines in the cycle related to training in the profession, and the educational component remaining part content is determined by the university. The electives constitute a major part of the list of disciplines within the educational component. This allows the student to build his or her own individual learning trajectory. In addition to the general and specialized educational cycles, there are the following 2 cycles of disciplines within the master program curriculum structure: the practical training sessions and research work and

the final state qualifying evaluation. It is noteworthy that according to the federal state educational standards, the practical training periods and the research work are included into one section. Both components accounts for 37.5% to 42% (worth 45 to 50 credits) of the total program workload within the basic curriculum. One should welcome such an approach as the practitioners should be guided by the scientific achievements, and the theoretical scientist should be familiar with the best practices. However, the ratio of practical training and theoretical research in the master training programs may vary and should be different for the future practitioners and research scholars. The practical training types and student placement locations are determined by the university and are based on the master student training purposes. Practical training sessions can be organized in independent organizations and in the university departments, research laboratories and other units (e.g. in the research centers) (cf. clause 7.16 of the federal educational standards).

As for the master program students' research work, the standard explicitly prescribes that it is obligatory for the students to be engaged in research work within the framework of the program curriculum. That means that all the students, without exception, should participate in research work to some extent but the total research work volume and format can be different for different master program students groups (cf. clause 7.16 of the federal educational standards). In accordance with the federal higher education standards, the key stages of R&D work are the following: research work planning, including familiarization with the subject-matter of research in the area and the research topic selection; conducting the research; research work plan updating; research report drafting and public defense of the thesis.

The key master program student research work formats are: a research seminar, preparation of final research paper (a master thesis); practical training in doing the research and/or R&D work during the practical training period and other forms of independent research.

Modern views on education predetermine the focus on personal development, the focus on formation of skills needed to make independent decisions, broaden the knowledge and work in the presence of probability of instable situations. In view of the above, it is re-

quired that interactive approaches to teaching be used, especially when conducting research projects in general and research seminars in particular. Data search and problem solving components within the interactive approach to learning help learn about the process of resolving real-life issues in small student groups, help discuss issues and test the hypotheses. The so-called partner approach to education is becoming increasingly popular. It is aimed at fighting the master students' habit of being used to stereotyped thinking formed under the influence of lectures and textbooks while developing improvised presentation skills through debating and offering arguments against certain views. Ability to identify the connection between the cause and effect of events and idea implementation is the key component of success in a research work. Teamwork and leadership skills as well as the sense of responsibility for the final outcome, and the ability to identify the individual contribution to finding the rationale behind the final solution are proactively formed in small student groups. The master-training universities and the employers interact in many forms. The main goal here is to form appropriate professional competencies by including relevant disciplines into the list of subjects studied, in particular, the courses developed by the employers, and to promote experiential learning by attracting highly qualified practitioners, organizing student placements, in particular, within the framework of the research practical training periods, etc. By concluding special admission agreements, the employers have an opportunity to identify even more field – specific goals and objectives. University collaborative provision department foundation is a very important milestone in solving the practical problems and addressing the teaching and research harmonization issue including the teaching and research harmonization issue that arises when master students do their research within the framework of their theses. Teaching staff members who have both the academic degree and academic tittle have a right to become the master degree program student academic advisors under the current regulations. Thus, there are restrictions in regard to hiring practitioners from the industry to become student academic advisors. The universities have to take some steps, for instance, to use the consultants' services or apply additional criteria for admission to the posi-

tion of an academic advisor (article publication on the topics relevant to the student master thesis, etc.). The last but not the least component in the master degree program curriculum is the final state qualifying evaluation which includes the defense of the final graduation paper. According to the basic curriculum, the final graduation paper is a master thesis. It is an independent and logically complete final graduation paper relevant to the master student's future area of operation and problems within the field (research, economic project work, analysis, management, education) (cf. clause 8.7 of the federal educational standards).

A prerequisite for admission to the master thesis public presentation and public discussion are the student research conference (roundtable discussion) presentation and an article publication. The Russian universities have all the necessary conditions for achieving this. For instance, major events are organized, such as the Moscow Student Research Congress and the International Youth Financial Forum. Publications, including such specialized publications as *Young Researchers' Notes* are of great importance here.

Plenary session

MODERN PEDAGOGY WITH THE USE OF E-LEARNING IN HIGHER EDUCATION

Efficiency of Application of Remote Educational Technologies in Training Industry Specialists

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Abstract

The article reflects the results of the use of remote educational technologies in the educational process of the National Research University Moscow State University of Civil Engineering (MGSU). Describes the basics of the scientific-methodical approach to distance learning, developed and used by teachers and specialists of University graduates in the construction industry.

Keywords: distance learning technology, interactivity, distance course, virtual labs, multimedia, training portal.

For more than twenty years ago in the educational environment of Russian Universities has become the term «distance education». At present, Russian society in General and the academic community are almost overcome known prejudice against distance and e-learning methods. Came into effect new regulations that provide the legal basis for the use of distant technologies in the educational process, and carry a greater share of responsibility for the quality of training of specialists at the head University. The problems of distance education development began to be much wider than the original.

Most of the leading higher educational institutions of Russia, including our University is currently developing and using means and methods of distance education. Received the development of case-technologies, Internet (network) and the telecommunication methods of distance learning. The level of development of modern electronic means of education in the University today is not inferior to the leading universities of the industrialized countries of the West. The solution of the problem of increase in the use of modern electronic and telecommunications and information technologies in education requires not only increase investment and improvement of financing mechanisms in the educational sphere, and readiness of the faculty actively to implement them. Implementation of educational programs for distance learning has always been customary for MGSU training of engineers-builders. Comprehensive development of information technologies allowed to introduce in the educational process of innovative educational technologies, based on the developments of the specialists, scientists and teachers MGSU, with the main purpose is to make the process of learning is more qualitative. The use of remote sensing technology helps students, allows you to learn on your own, to reduce time spent on visiting the University, have access to all teaching materials, and the ability to always seek the advice of the teacher.

Today in MGSU for programs of higher education by correspondence, using distance learning technologies more than 4,300 students, including from remote regions and other countries. Prepared 211 interactive distance learning courses on General and special disciplines, rich multimedia objects, virtual laboratory workshops. Since September 2014 it is planned to introduce the use of remote sensing technology in full-time and part-time forms of learning.

The content and composition of distance courses allows to achieve the educational-methodical purposes, and they use a scientific-methodological approach to the peculiarities of implementation of distance learning technologies in the process of training specialists of construction directivity, developed and applied in MGSU. In training courses integrated multimedia technologies, various graphic elements, photo, animation, hyperlinks to external Internet sources and additional literature that helps a better perception and learning.

In the beginning of studying students view a video demonstration of the introduction to the training course, accompanied with the presentation materials and the voice of the author. The video describes the main excerpts, notes and clarifications, which should guide the study of this material. Keep learning, distance learning online course, necessary for the theoretical and practical development of the material provided with presentations, selected parts on the degree of depth study and importance for development. In the course contains the necessary illustrations, graphics, formulas, pictures. The course is integrated with external and internal hyperlinks to the relevant sections and chapters in the course of additional literature, normative documents and information resources in the Internet. Work on editing, formatting of materials was performed by the employees MGSU, and programmers experienced technical support to the development of electronic courses. Individual tasks to perform control and practical work in the study of interactive educational materials allow to learn, go through self-control and the current certification.

The presented materials tailored to the specifics of the perception of information from the screen, without excessive volume of the text part, with a maximum accenting with the purpose of attraction of attention of the learner. For this purpose, we used the breakdown for small heads, adding hyperlinks and reference information from photo inserts, structuring the material on commitment and optionality.

The education is carried out through training portal e-learning server. This is a system that can provide all cycle of e-learning: registration of students and teachers, the management of their personal Affairs; the creation and publication of exercises and tests, training materials in a different form; consideration of performance in electronic electronic record book (for students).

Educational process of the student campus is built so that all jobs for the current certification and some of the subjects, as a rule, humanitarian, he hands remotely, and examinations in special and profile disciplines – campus during the session at the University. Under such conditions, the time of arrival of the student session is reduced from 21 days to 3-4 days, the student becomes more mobile and experience fewer problems with your employer.

In MGSU provides the training process of the students from remote regions. In the cities of Nizhnevartovsk, Mineralnie Vody, Surgut, Novorossiysk, Veliky Novgorod, Stavropol, Smolensk, Electrostal, Samara, Ufa students have the opportunity to receive high-grade knowledge, combining training with work, family. In specially equipped classrooms it is possible to learn in online together with students from other cities, in consultation with the University, located in Moscow. Students receive all the necessary training materials, and complete assignments, working on learning portal MGSU.

Developed in MGSU interactive educational materials received positive reviews, expert advice on implementation of the developed materials in the educational process in the preparation of the programs of secondary professional, higher education or advanced training of specialists of the building industry, specializing in industrial and civil construction, engineer networks, expertise and real estate management, fire safety.

IMPROVING THE QUALITY OF E-LEARNING

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Abstract

This work covers the most urgent problems concerning the quality of e-Learning in Russia. It also provides a summary of the authors' practical experience, which was gathered during the process of distance education implementation, on the example of the leading universities of Tyumen region. Nowadays, it has become very important to find a solution to the problems that prevent education from developing and integration processes from being implemented on a worldwide scale.

Keywords: E-Learning, system of education, digital technologies, ICT (Information Communication Technologies), online education, distance education, distance learning, distance technology, Internet-education, online (virtual) educational space.

According to the new educational law, E-Learning is becoming a compulsory part of the learning process in universities, rather than a choice made by institutions, which increases the necessity to carry out studies in the field of increasing the quality of online education.

Further development of the education system can be provided through achieving the main goal of interaction between the subjects of the learning process, which is the satisfaction of society's needs for accessible high quality education. Today more and more is said about education "on demand" on the level of universities – using network facilities to consolidate the efforts in improving technologies and online resources.

We think that all types of digital technology cannot replace traditional education but may enhance it, change its quality, give it a new development vector as well as to form innovative approaches on the condition of an acceptable technical background.

In the online educational (virtual) space, there is a distinct lack of unified policies, standards and terminology, which creates not only discrepancies, but also provokes problems that leave learning structures in impasse.

For example, training in penal colonies is connected to the impossibility to have field/professional practice as it is required by the training programme.

With regard to terminology, the 16th article of "The Law of Education" defines the terms "e-learning", "distance education technologies". However, in this case, what is "distance learning" which has come into the sphere of Russian education?

Under these circumstances, the task of creating a unified educational and informational-communicational space of the university, whilst preserving alternating functioning educational models, becomes more and more important.

We think it is necessary to introduce several new regulations that control their implementation on a national level as well as an international one, with the aim of successfully using new informational-communicational technologies in the educational process.

In Tyumen State Oil and Gas University, this task is being dealt with by continuous development and implementation of innovations in the methods of the educational process, one of which is the creation of the Center of Distance Education at the University in 2009 [1].

From the moment of creation, the Centre of Distance Education at Tyumen State Oil and Gas University has been developing dynamically. The level of organization of the educational process is being improved through activating pedagogical, economic, technical and social factors.

The considerable potential of the development of e-learning in the university is in the implementation of social training technologies.

Social technology is the complex of methods and approaches that allows to achieve results in cooperation between people, it is a structure of communicative impact that changes social systems or situations [2].

The interaction between the main subjects of the educational process (students, lecturers, specialists in educational-methodical work of the Center of Distance Education) is going on the in the support system of the educational process "Educon". Electronic training methodological complexes (ETMC), developed by the university lecturers, contain electronic textbooks, practical tasks, course works, examination work, virtual laboratory work, intermediate and final tests, and are also part of this system.

In distance learning the student independently studies a discipline and therefore the need for help in studying the material is increasing. Such support is provided by tutors-lecturers who manage the educational activity of students in a manner, which is technically sound, sensible and effective by directing the process of gaining knowledge, obtaining skills, developing abilities of students through implementing special approach and techniques in the educational process.

Furthermore an institute of tutors-organizers was created. They deal with organizing of the activity of the tutors-lecturers in the departments. The workers of the Centre of Distance Education have a function of coordination and they also act as tutors-supervisors who bear the responsibility for organizing the educational process in groups allocated to them.

Lecturers of Tyumen State Oil and Gas University take professional development courses at the Centre of Distance Education:

– «Lecturer (tutor) of distance learning»;
– «Organizing of distance learning at a university»;
– «The information technologies of distance learning».

The lecturers use the knowledge and skills acquired when they work with students of the Centre of Distance Education by improving ETMC, searching for and implementing new formats of interacting with students on-line, off-line and during webinars.

The training-methodological work specialists in the Centre of Distance Education provide consulting support to the students and lecturers in technical issues connected with the system of supporting the educational process "Educon", as in questions of virtual interaction.

The aforementioned social technologies motivate the subjects of

the educational process to learn modern technologies of the educational process, new formats of interaction, which leads to the ceaseless development of on-line education and the improvement of its quality.

Nowadays, the contingent of Centre of Distance Education comprises about 2000 students from different cities in the Russian Federation and abroad.

The Centre of Distance Education (CDE) is developing a partnership with the universities of Russia and neighboring countries and also with branches of Tyumen State Oil and Gas University [3].

Each partner has the status of territorial point of access (TPA) of CDE. Contracts have been signed with TPA, according to the contracts, the TPAs carry out advertising campaigns, admit new students, carry out entrance exams, form and send the personal information about each student to CDE. In addition, TPAs provide computer classes to the students in order to connect them to the system "Educon", for participation in webinars and for taking intermediate and final exams.

Thus, the CDE is an innovational structural part of Tyumen State Oil and Gas University that was created in 2009. It is developing and implementing innovational technologies in specialists training in specialized secondary education and Bachelor training areas as well as in training lecturers of Tyumen State Oil and Gas University [4].

On the basis of the analysis of the development of distance education at Tyumen State Oil and Gas University it is possible to come to a conclusion about the growing virtualization of the interaction between subjects of distant education with the use of distance technologies.

For the future development of distance education at Tyumen State Oil and Gas University it is necessary to find innovational social technologies of the interactions between the subjects of Internet partnership in on-line education.

Representatives of all of Russia and its neighbors study at Tyumen State Oil and Gas University, therefore, it is possible to say that the tendencies and the trends at the University reflect characteristics of the whole region and virtual space of Russia.

At the present stage, the strategy of development implies network collaboration and consolidation of efforts in forming a high quality virtual educational environment, which is beneficial not only from an economic point of view but also a social one.

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INFORMATICS EDUCATION: EUROPE CANNOT AFFORD TO MISS THE BOAT

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Premise

• Informatics used *à la European* here as a synonym of "Computer Science", "Computing", "Information Science", IC(S)T

…

and outline

• We need coordinated goals and efforts at all levels
• What is happening and what is NOT happening
• Zooming into some initiatives

Strategic relevance of the field

• Informatics is the heart and brain of modern society
• Wealth and growth, security and sustainability directly depend on it
• But it is so pervasive that it became invisible
• *Direct* (not just *indirect*) investments in Informatics needed if we wish to contribute to shaping the future

Executive summary

1. All of Europe's citizens need to be educated in both digital literacy and informatics.
2. Digital literacy covers fluency with computer tools and the Internet.
3. Informatics covers the science behind information technology. In-

formatics is a distinct science, characterized by its own concepts, methods, body of knowledge and open issues. It has emerged, in a role similar to that of mathematics, as a cross-discipline field underlying today's scientific, engineering and economic progress.
4. Informatics is a major enabler of technology innovation, the principal resource for Europe's drive to become an information society, and the key to the future of Europe's economy.
5. European countries are making good progress in including digital literacy in the curriculum. The teaching of this topic should emphasize the proper use of information technology resources and cover matters of ethics such as privacy and plagiarism.
6. Informatics education, unlike digital literacy education, is sorely lacking in most European countries. The situation has paradoxically worsened since the 70s and 80s.
7. Not offering appropriate informatics education means that Europe is harming its new generation of citizens, educationally and economically.
8. Unless Europe takes resolute steps to change that situation, it will turn into a mere consumer of information technology and miss its goal of being a major player.

4 key recommendations
1. All students should benefit from education in digital literacy, starting from an early age and mastering the basic concepts by age 12. Digital literacy education should emphasize not only skills but also the principles and practices of using them effectively and ethically.
2. All students should benefit from education in informatics as an independent scientific subject, studied both for its intrinsic intellectual and educational value and for its applications to other disciplines.
3. A large-scale teacher training program should urgently be started. To bootstrap the process in the short term, creative solutions should be developed involving school teachers paired with experts from academia and industry.
4. The definition of informatics curricula should rely on the considerable body of existing work on the topic (the report gives examples). The risks of being inactive "… without effective informatics teaching,

a serious risk exists that Europe becomes a mere consumer of technologies designed elsewhere, running on devices also manufactured elsewhere. Such an outcome would have dismal implications for Europe's future. It is the working group's opinion that this outcome is not inevitable and that the key to leadership lies in a modern curriculum integrating informatics as well as digital literacy."

The "S" in ICST

• Intellectually challenging and deep concepts
‣ Algorithms
- how far can machines go?
- the limits of computation, correctness, …
- the difference between solvable and practical
‣ Data structures, from "in the small" to DBs, wharehouses, "big data"
‣ Concurrency, distribution, collaboration
‣ Artificial languages
‣ Abstractions and modelling

The foundations of computing are needed
• To understand how the world one lives in works
• To sustain and improve any field of society
‣ ICST is the enabling factor
- from physics to medicine to mechanics, humanities, art
‣ ICST is the source of innovation and competitive

Advantage

Learn from the past
• Over the past century, a key factor in establishing today's industrial society has been to include as compulsory subjects in the secondary school curriculum, with some preparation in primary school, such fundamental scientific disciplines as mathematics, physics, chemistry and biology. It is not that one wants to train every student to become a mathematician, physicist, chemist, or biologist; rather, society has recognized the need for every citizen to understand the basic concepts of these sciences, as there is no technology and no sound economic reasoning without mathematics, no engineering without physics and chemistry, no medicine without biology.

• This requirement remains as valid today as it was in the past.
• The new factor is the emergence of a new scientific subject, informatics. In today's world, and even more as we move towards an ever more computing-intensive world, being familiar with informatics is as critical to every citizen as being familiar with traditional scientific disciplines. To be prepared for the jobs of the 21st century, students must not only be digitally literate but also understand key concepts of informatics.
• The emphasis on informatics as a science as opposed to just using digital technology also helps a proper gender balance in the field: the scientific value as well as the emphasis on the human issues (such as understanding users and their needs) is attractive to students of both genders.

The depth of informatics education
• Computational thinking (J. Wing)
‣ Includes two aspects:

1. "Problem-solving techniques"
- Representing information through abstractions such as models and simulations.
- Logically structuring and analyzing data.
- Automating solutions through algorithmic thinking, involving carefully described sequences of steps taken from a well-defined catalog of basic operations.
- Identifying, analyzing and implementing possible solutions with the goal of achieving the most efficient and combination of steps and resources, including both human and hardware resources.
- Formulating problems in a way that facilitates the use a computer and computerized tools to help solve them.
- Generalizing the problem-solving process to a wide variety of problems.
• Computational thinking…

2. "Intellectual practices"
- Confidence in dealing with complexity (since software systems commonly reach a degree of complexity far beyond what is routinely handled in other forms of engineering).

- Persistence in working with difficult problems.
- Tolerance for ambiguity (to be reconciled with the necessary rigor in ensuring the correctness of the solutions).
- Ability to deal with open-ended problems.
- Ability to deal with a mix of both human and technical aspects; the human dimension (user needs, quality user interfaces, appropriate training, user psychology…) is always essential in IT systems.
- Ability to communicate and work with others to achieve a common goal or solution.

Concluding on K-12 … !

It is no longer sufficient to wait until students are [at university] to introduce these concepts. All of today's students will go on to live a life heavily influenced by computing, and many will work in fields that involve or are influenced by computing. They must begin to work with algorithmic problem solving and computational methods and tools in K-12.

Concluding the talk

• The challenges of research and education in Informatics are vital for the future of Europe

• The voice must be heard loud and clear

• We need to aggregate, coordinate, and make the voice of academia stronger if we want to be influential

• *Tomorrow will be too late*

CONCEPTUAL FRAMEWORK OF CONTENT FOR ENGINEERING DISCIPLINES

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Abstract
The paper describes the main approaches to content presentation in engineering disciplines in the context of e-learning at Internet Institute, Tula State University.
Keywords: content for academic subject areas of engineering specialties, distant learning technologies, electronic learning resource, virtual laboratory-based work, compact interactive schemes and charts, 3D-animation, Flash – and video-clips, glossary.

Currently Internet-Institute is not only the integral part of educational process at Tula State University, but also the effective tool of developing students' skills and competences by means of getting them interested in useful cognitive Internet resources.

Throughout the past five years Tula State University has been involved into carrying out an empirical research directed towards development and simultaneous implementation of distant learning technologies using the Internet. This research is being conducted on the basis of a specially established structural division, namely, Internet-

Institute, which organizes the educational process with the help of Internet resources and technologies.

E-learning is implemented on humanitarian, juridical, economic and engineering specialties by means of open-source learning platform MOODLE which provides the students with an access to the educational content and the tutor with an access to monitoring and assessment tools.

The main teaching unit in e-learning is an electronic learning resource designed in accordance with the technology specially developed at Internet-Institute.

One of the main difficulties in adapting academic subject areas to being used in e-learning is concerned with creating the electronic learning resources of such engineering specialties as 'Engineering Graphics', 'Performance of Construction Materials', 'Electric Engineering', 'Machine Components', 'Material Engineering', 'Fundamentals of Energy Engineering', etc. Since these academic subject areas are quite difficult for understanding, the electronic learning resources should include not only lecture courses, but also the sets of tests, lists of topics for term papers, self-study tasks, and tasks for virtual laboratory-based work, because these types of learning activities can help the students solidify acquired theoretical knowledge.

The student gets the preliminary idea of an academic subject area watching a video-presentation prepared by the tutor where the subject matter, its aims, goals and tasks are revealed.

To provide the best understanding of theory, the electronic learning resources are supplied with full-color graphic presentations.

The resources contain large amounts of theoretical data supported by hyper-links which let the students go to the third-party Internet sites for more profound conversance with the subject matter.

To reach the aim of demonstrativeness and clarity the theoretical data are presented in the form of compact interactive schemes and charts where it is possible to click on any element to get more detailed description.

Закладки О курсе Лекционный материал Учебное пособие Поиск

Тема 7. Производство электроэнергии. Современные и перспектив источники электрической энергии

7.4. Гидроэлектростанции (ГЭС)

объясняется отсутствием на ГЭС крупных механизмов в системе собственных нужд.

При сооружении ГЭС одновременно с энергетическими решаются важные народнохозяйственные задачи: орошение з развитие судоходства, обеспечение водоснабжения крупных городов и промышленных предприятий и т. д.

Технология производства электроэнергии на ГЭС довольно проста и легко поддается автоматизации. Пуск агрегата ГЭС зани более 50 с, поэтому резерв мощности в энергосистеме целесообразно обеспечить именно этими агрегатами.

Коэффициент полезного действия ГЭС обычно составляет около 85-90 %. Благодаря меньшим эксплуатационным р себестоимость электроэнергии на ГЭС, как правило, в несколько раз меньше, чем на тепловых электростанциях.

Рисунок 7.3 - Размещение основных объектов приплотинной ГЭС
а – план: 1 – здание ГЭС; 2 – станционная бетонная плотина; 3 – бетонный водосток;
4 – право- и левобережная каменно-набросные плотины; 5 – ОРУ ВН и СВН;
б – разрез по станционной плотине: 1 – плотина; 2 – водовод;
3 – площадка электротехнического оборудования высокого напряжения; 4 – здание машинного зала ГЭС

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Закладки О курсе Лекционный материал Лабораторные работы Практическая работа Самостоятельная работа Поиск

Тема 2. Тепловые электрические станции

2.3. Паровые котлы и их схемы

Любая конденсационная паротурбинная электростанция включает в себя четыре обязательных элемента:

- энергетический котел,
- турбоагрегат,
- конденсатор,
- питательный насос.

Таким образом, в ПТУ над рабочим телом совершается непрерывный цикл преобразования химической энергии сжигаемого электрическую энергию.

Кроме перечисленных элементов, реальная ПТУ дополнительно содержит большое число насосов, теплообменных аппаратов, необходимых для повышения ее эффективности.

Рассмотрим подробно технологический процесс производства электроэнергии на ТЭС, работающей на газе (рисунок 2.5).

Рисунок 2.5 - Технологический процесс производства электроэнергии на ТЭС, работающей на газе

Закладки О курсе Лекционный материал Лабораторные работы Практическая работа Самостоятельная работа Поиск

Тема 3. Ядерные энергетические установки

3.8. Паровые турбины

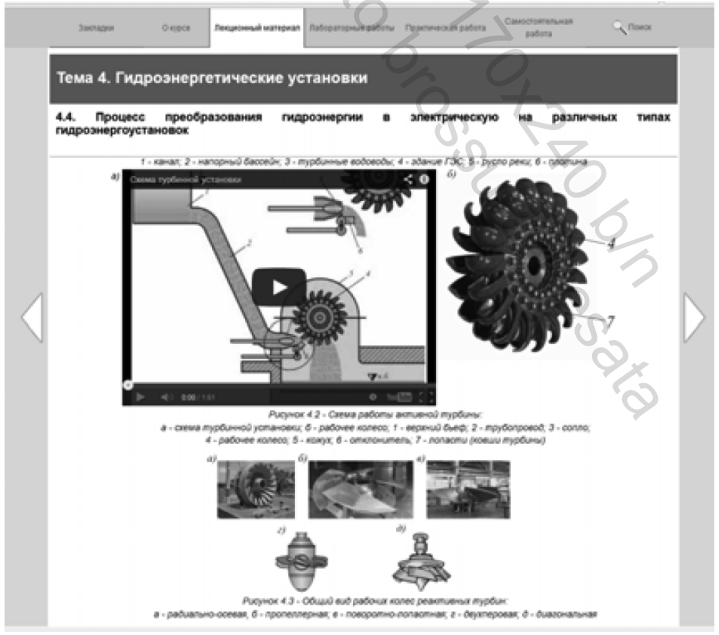
3.8.3. Устройство паровой турбины

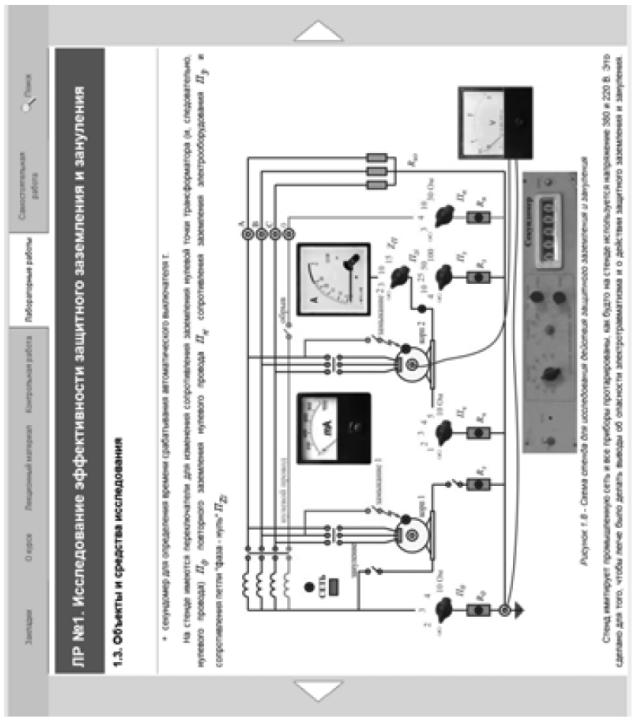
Типичная паровая турбина показана на рисунке 3.1.

Рисунок 3.1 - Типичная паровая турбина

Для того чтобы увидеть внутреннее устройство турбины, при ее изображении «вырезан» передняя верхняя четверть. Точно такие показана лишь задняя часть конуса 2. Турбина состоит из трех цилиндров (ЦВД, ЦСД и ЦНД), нижние половины корпусов которых обозначены соответственно 39, 24 и 18. Каждый из цилиндров состоит из статора, главным элементом которого является неподвижный корпус, и вращающегося ротора. Отдельные роторы цилиндров (ротор ЦВД 47, ротор ЦСД 5 и ротор ЦНД 11) жестко соединяются муфтами (31 и 21. К полумуфте 12 присоединяется полумуфта ротора электрогенератора (не показан), а к нему - ротор возбудителя. Цепочка из собранных отдельных роторов цилиндров, генератора и возбудителя называется валопроводом. Его длина при большом числе цилиндров (а самое большое их число в современных турбинах - 5) может достигать 50 м.

Валопровод вращается во вкладышах 42, 29, 23, 20 и т.д. опорных подшипников скольжения на тонкой масляной пленке и не касается металлической части вкладышей подшипников. Как правило, каждый из роторов размещает на двух опорных подшипниках. Иногда между роторами ЦВД и ЦСД устанавливают только один общий для них опорный подшипник (см. позицию 29). Расширяющийся в турбине пар заставляет вращаться каждый из роторов, возникающие на них мощности складываются и достигают на полумуфте 12 максимального





3D-animation, Flash – and video-clips are also used while designing electronic learning resources in order to meaningfully demonstrate a peculiar complicated engineering system in operation.

For instance, the use of 3D-animation, Flash – and video-clips in electronic learning resource 'Engineering Graphics' allows the students to visualize in 3D the sequence of steps in making a drafting projection and understand the methods of solving engineering tasks, that is rather difficult to do using a 2D textbooks. Visualization and better understanding affect the accuracy and time of graphic work performance favorably.

In the resource 'Fundamentals of Energy Engineering' the theoretical schemes explaining how different power plants work were replaced with Flash-clips demonstrating in detail the principles of various power plan components work performance and substance circulation.

To increase the quality of students' performing the tasks of virtual laboratory-based work, such resources as 'Electric Engineering' and 'Performance of Construction Materials' have instructional guidelines in the format of scored Flash – and video-clips. They explain the students the preparatory procedures, the plan and the steps of virtual laboratory-based work itself. This fact allows replacing the 'real' laboratory-based work (sometimes expensive and even dangerous) with the virtual ones.

Apart from theoretical data, the electronic learning resources also contain highlights from regulatory documents and reference data; these materials help the students study the course without using supplementary sources data.

The electronic learning resources designed by us were developed with the use of HTML markup language and up-to-date software; they have clear and user-friendly interface as all the course content is divided into separate thematic modules. There are also functions of searching according to key words and making marks while reading. The resources are supplied with the lists of highly-specialized terms (glossary). Navigation is also user-friendly and lets the students study the academic subject area in a mode comfortable for them.

Internet-Institute specialists have also developed a tool of assessment: it is a program which allows checking the correctness of the vir-

tual laboratory-based works and organizing final testing distantly and remotely. The use of electronic learning resources in MOODLE presupposes that the students choose the strategy of studying the course independently and by themselves. It is necessary to add that the database saves all the attempts of data input (either correct of incorrect); this fact gives the tutor a possibility to differentiate the assessment of each work depending on the number of attempts.

To draw a conclusion, we would like to emphasize the fact that our electronic learning resources are universal multimedia learning resources presenting all the necessary educational material. Studying on their basis students do not need any other supplementary information sources for performing engineering graphics or calculation tasks. Multimedia electronic learning resources meet all the modern requirements for e-learning; they can be continuously replenished and have been developed for the students to help them learn the academic subject areas of engineering specialties.

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Plenary session

INTERNATIONAL TRAINING MASTER
AND PHD PROGRAMS IN SAPIENZA UNIVERSITY OF ROME

Inter-university cooperation between Italy and Russia: International agreements of Sapienza with Russian institutions

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Abstract

The academic and cultural cooperation between Russia and Italy started nearly thirty years ago! The first agreement between institutions of the two countries was signed on April 9 1987 with the Mikhail Vasil'evich Lomonosov Moscow State University.

Since then, many other agreements have been signed and now Sapienza University counts a number of more than one hundred agreements with the most important and renowned institutions of Russia.

Keywords: agreements, cooperation, research.

A long-lasting cooperation

The academic and cultural cooperation between Russia and Italy started nearly thirty years ago! The first agreement between institutions of the two countries was signed on *April 9 1987* with the Mikhail Vasil'evich Lomonosov Moscow State University.

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Fields of research

The fields of research in which the cooperation is more intense are:

- languages and philosophy
- medicine
- physics
- architecture and civil engineering

Languages and Philosophy

Languages and philosophy are surely the fields in which Sapienza has got the highest number of research projects.

In such fields our most important partners are:

- Irkutsk State Linguistic University
- Moscow State Linguistic University
- Russian State University for the Humanities
- Pushkin State Russian Language Institute

Medicine

The cooperation in medical research is carried on by Sapienza with five different institutions, that are:

- Daghestan State Medical Academy
- Mikhail Vasil'evich Lomonosov Moscow State University
- Moscow State University of Medicine and Dentistry
- North-West State Medical University
- University of the Russian Academy of Education

Physics

In the field of physical research our partners are:

- Landau Institute for Theoretical Physics (Moscow)
- Russian Academy of Sciences – Institute for Problems in Mechanics (Moscow)
- Mikhail Vasil'evich Lomonosov Moscow State University (two different Executive Protocols)

Architecture and Civil Engineering

Sapienza's partners in architecture and civil engineering research are:

- MISIS – National University of Science and Technology
- Moscow Architectural Institute

- Università statale per l'Ingegneria civile e l'architettura di San Pietroburgo
- Moscow Architectural Institute

Some of our most illustrious partners

- Russian Academy of Sciences
- North-West State Medical University
- Diplomatic Academy of the Ministry for Foreign Affairs of the Russian Federation
- South Ural State University
- Kursk State University
- Daghestan State Medical Academy
- Daghestan State University
- Moscow State University of Economics, Statistics and Informatics
- MISIS – National University of Science and Technology
- Moscow State Linguistic University
- "Mikhail Vasil'evich Lomonosov" Moscow State University
- Moscow City Psycho-Pedagogical University
- Russian State University for the Humanities
- Ivanovo State University of Chemistry and Technology
- Landau Institute for Theoretical Physics
- Moscow Architectural Institute
- Institute of modern Arts
- Moscow State University of Culture and Arts
- National Research University of Electronic Technology
- Russian Presidential Academy of National Economy and Public Administration RANEPA
- Saint-Petersburg State UniversityAdmiral Makarov State Maritime Academy
- Saint Petersburg National research University of information technologies mechanics and optics
- Saratov State Technical University
- North-Caucasus Federal University
- Tomsk State University Tula State Lev Tolstoj Pedagogical University
- Vologda State Pedagogical University and Volgograd State Technical University

- Shuya State Pedagogical University
- Grozny State Oil Technical University
- Chechen State Pedagogical Institute
- Ufa State Aviation Technical University (USATU)

Quality Assurance in Higher Education in Italy

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Abstract
Back in 1998 the Bologna Declaration established standards and guidelines to harmonize Higher Education system and to cooperate in quality assurance in order to develop comparable criteria and methodologies. But this process was rather slow to be implemented, still some important steps had been taken.
After the Bologna declaration Italian Ministry of Education created several bodies to evaluate national Institutions.
Keywords: quality assurance, evaluation, QA agencies.

The Quality assurance process in Italy is still underdeveloped in comparison to the similar institutions in other countries of the world and even of Europe. Back in 1998 the Bologna Declaration established standards and guidelines to harmonize Higher Education system and to cooperate in quality assurance in order to develop comparable criteria and methodologies. But this process was rather slow to be implemented, still some important steps had been taken.

After the Bologna declaration Italian Ministry of Education created several bodies to evaluate national Institutions:

- *CNVSU*: National Committee for the Evaluation of the University system, body financed and related to the Ministry of Education;
- *CIVR*: specific body to evaluate research activities.
- *Evaluation Centers*: centers, meant to evaluate Faculties' activities and programs:

- *CRUI*: body that used evaluation and certification methodologies according to international environment and related to EUA guidelines.

Specific functions of these bodies were not always clear and they often resulted to do similar or same job. Even though those bodies were strong in approval process and initial accreditation, but lacked periodic reviews and often failed to apply the Quality Assurance process.

They were also not in line with the standard of Independence, introduced by the Bologna process, because all of them were financed by the Educational Ministry.

In 2005 during the Conference in Bergen, the European Standards and Guidelines (ESG) for Quality Assurance to improve the European Higher Education Area (EHEA) were introduced for the first time.

Seven years later, during the Conference in Bucarest in 2012, ENQA (European Association for Quality Assurance) underlined the necessity to strengthen its efforts in order to make the ESG the foundation of all kinds of quality assurance commonly accepted by all relevant actors. This is the precondition for keeping the high level of acceptance of the quality assurance results in the EHEA. That meant that the Quality Assurance Standards had to be equally implemented and respected throughout Europe.

Italy is part of the Bologna Process since its very origin, but it was not early than in 2010 that the law n.240 introduced an external agency in line with ESG of ENQA.

The Italian external agency is called ANVUR – National Agency of Higher Education System and Research Evaluation (Agenzia Nazionale di Valutazione del Sistema Universitario e della Ricerca).

According to ESG ENQA 2005/2009 ANVUR would apply criteria and range to evaluate and approve initial qualification, to elaborate and publish periodic review and regular reports of Institutions and courses.

The Quality Assurance involves all the academic aspects and each sector has its own regulation.

Details related to ANVUR Statement and policy are contained in the Final Document.

By now ANVUR has already become an ENQA member and

started its full-scale activity of evaluation. While, during the academic years 2012-2014 some Italian Higher Institutions such as "La Sapienza" University of Rome participated in the ANVUR pilot project.

At the moment ANVUR is introduced in all Italian Higher Institutions in order to satisfy European Standards and Guidelines (ESG) for Quality Assurance promoted by ENQA in 2005.

In the ANVUR Statement there are several parameters to apply the ESG of ENQA Quality Assurance.

The Periodic Review will be divided in two phases:

- Annual Report;
- Evaluation every 3 or 5 years, according to Faculties, of the general structures of the Courses held.

Sapienza University of Rome has introduced its own evaluation body for the internal quality assurance, NVA (Nucleo di Valutazione Ateneo), responsible for specific areas, such as University information system, students support services, library services, PhD courses, internal quality assurance process, the place of Sapienza in the National and International university Ratings, Master's and Specialization courses, life long learning opportunities, the internationalization activities of research and teaching processes, budget and accounting system. – See more at: http://www.uniroma1.it/ateneo/governo/nucleo-di-ateneo/relazioni-annuali#sthash.VPwb2Qxl.dpuf.

NVA issues an annual report regarding all these aspects of the internal quality assurance process.

Inter-University Mobility and European Programmes: data, countries and prospectives of Erasmus Mundus for Sapienza University of Rome

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Abstract
Students, university staff and professors mobility is the main tool of internationalization for the Italian Universities. Student mobility agreements make international learning opportunities possible by exchanging students with selected universities. Sapienza has a wide range of student mobility agreements based upon reciprocity.
Keywords: mobility, exchange, Erasmus.

Students, university staff and professors mobility is the main tool of internationalization for the Italian Universities. Student mobility agreements make international learning opportunities possible by exchanging students with selected universities. Sapienza has a wide range of student mobility agreements based upon reciprocity.

Exchange students enjoy a wide range of services such as guidance and tutoring (SOrT), info and reception (Urp, Hello), free transportation (Minerva), a help desk for people with disabilities, cafeterias, libraries, sporting facilities (Cus), cultural centres, technological facilities and more.

We currently manage over 1,000 inter-institutional Erasmus agreements with 400 universities in all participating countries. That means our students have more options than ever before. Each year

there are over 1,100 incoming and outgoing students. In addition to the Erasmus programme international students can choose to spend time studying or working on research projects at our University. But Sapienza, as the biggest University in Europe is connected to the world, giving a special priority to the exchange programmes extra-Erasmus. A project that deserves a particular attention for its vast geographical and scientific coverage and financial capacity is Erasmus Mundus. It is sponsored by the European Union by means of various consortium between the EU institutions and the extra-EU institutions from all over the world[1]. As a programme for "mobility and cooperation", Erasmus Mundus unites the mobility with cooperation in scientific and educational field[2]. Education, Audiovisual and Culture Executive Agency (EACEA)[3], is a European Institution responsible for effective implementation and work of this programme[4].

This programme is addressed to various target groups by means of different actions: to the students[5]; to the universities, to the lecturers and researchers[6], to the research institutions and think tanks (public

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[1] Cfr. http://www.erasmusmundus.it/

[2] "Erasmus Mundus is a cooperation and mobility programme in the field of higher education that aims to enhance the quality of European higher education and to promote dialogue and understanding between people and cultures through cooperation with Third-Countries. In addition, it contributes to the development of human resources and the international cooperation capacity of Higher education institutions in Third Countries by increasing mobility between the European Union and these countries.": http://www.uniroma1.it/internazionale/studiare-e-lavorare-allestero/erasmus-mundus.

[3] Cfr. http://eacea.ec.europa.eu/index_en.php.

[4] Cfr. http://eacea.ec.europa.eu/erasmus_mundus/index_en.php.

[5] "European students are those resident in 27 countries of the EU and from Efta – See countries (Iceland, Liechtenstein, Norway).

Scholarships are different for different categories of students:

Category A: students from the third countries that who have not lived in the EU for more than 12 months in the last 5 years.

Category B: students who do not soddisfy the requirements for the Category A": http://www.uniroma1.it/internazionale/studiare-e-lavorare-allestero/erasmus-mundus/studenti.

[6] http://www.uniroma1.it/internazionale/studiare-e-lavorare-allestero/erasmus-mundus/docenti-e-ricercatori.

or private) and Higher Education Institutions. The EM programme includes the following actions:

- Action 1: Erasmus Mundus joint programmes of outstanding quality at masters (Action 1 A) and doctoral (Action 1 B) levels including scholarships/fellowships to participate in these programmes;
- Action 2: Erasmus Mundus Partnerships between European and Third Country higher education institutions including scholarships and fellowships for mobility at all academic levels;
- Action 3: Promotion of European higher education through projects to enhance the attractiveness of Europe as an educational destination and a centre of excellence at world level.

"Sapienza" University of Rome takes part of 20 University EM consortium (one is coordinated by Sapienza) and with the help of Department IX – International Relations[7], gives an opportunity to the students, researchers and lecturers to have study and research periods abroad and to host students and colleagues from the extra-EU countries.

The main projects, financed in the years 2009-2013 has offered bigger scholarships and more effective mobility assistance in comparison to other existing projects (Erasmus, for instance), thus facilitating the mobility with the countries, characterized by major burocratic and technical difficulties (especially the visa application processes)[8].

All the applicants have to undergo a selection procedure in frames of a certain call. The scholarships for the following projects were available last year:

- MULTIC (Multidisciplinary capacity-building for an improved economic, political and university co-operation between the European Union and the Russian Federation), financed to promote the mobility between the European Union and the Russian Federation. The second and the third call were open in April and August

[7] Cfr. http://www.uniroma1.it/ateneo/amministrazione/uffici-amministrativi/ripartizione-ix-relazioni-internazionali. Graziella Gaglione and Alessandra Criscuolo, staff of the International Department responsible for the ex chance programmes have participated in eleboration of this data.

[8] http://www.uniroma1.it/internazionale/studiare-e-lavorare-allestero/erasmus-mundus/bandi-aperti.

2012[9], addressed to PhD students and researchers from the Russian Universities and the European partners (among which there is Sapienza) and vice versa, covering all the disciplines for a 6-months mobility period[10];

- TEE (Transatlantic Partnership for Excellence in Engineering) is the main project between the EU and Canada and the United States, for PhD Candidates and Post-Doc students of the Engineering field.
- Mundus ACP (Africa, Carrabin and Pacific), is destined to all the categories incoming to Europe and to university lecturers and personnel of Sapienza University of Rome from various scientific sectors outgoing for a 1-month exchange and research period to the partner universities[11];
- ELEMENT (Egypt-Lebanon-EU Mobility Exchange NeTwork) is a project for students, PhD candidates and Post-Doc and staff exchanges between the consortium universities (like Sapienza) with the Universities from Egypt and Lebanon[12];
- Avempace – Jordan and Syria is a project active in all scientific and disciplinary sectors, that implies various mobility periods and destined to various categories incoming and outgoing from Jordan and Syrian universities[13].

In the previous years other projects had been financed. Such as Basileus (between the EU and the Balkan countries)[14], Caucasus cooperation project (between the EU, Georgia, Armenia and Azerbaijan)[15]; LISUM (EU-China)[16] and an exchange project between the EU and Palestinian Universities, coordinated by a Belgium University.

On the basis of the quantitative and qualitative data of the mobili-

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[9] Cfr. http://mundus-multic.org/project/news-source/2nd-call-for-applications-open.

[10] Cfr. http://tee-net.webs.upv.es/.

[11] Cfr. http://mundusacp2.up.pt/.

[12] Cfr. http://www.em-element.eu/.

[13] Cfr. http://www.avempace.eu/.

[14] Cfr. http://www.basileus.ugent.be/index.asp.

[15] Cfr. http://www.erasmusmundus5.gr/.

[16] Cfr. http://www.lisum.ugent.be/index.asp.

ty, some observations on the tendencies and prospectives of these programmes have emerged.

For the year 2011-2012 there are some specific features as far as the incoming students are concerned. In frames of the Basileus programme, one can see a positive trend of Incoming bachelor and master students (23 in total) to the departments of social-political and economic sciences. Mundus ACP has brought 23 people, 18 of which came for Master's programmes mainly in political, social, economic sciences and cooperation and 4 PhD Candidates, mainly male. Sapienza hosted 8 (4 Master and 2 PhD Candidates) students from Caucasus (Erasmus Mundus 5) and as many as 28 students from Russia (MULTIC programme), attending various courses, mainly economic, humanities and IT departments.

Along with other mobility programs – such as EU-NICE with Asian countries (15 plus 28, overwhelmingly male, for master's degree in civil engineering), EuroTango with Argentina (4 PhD Candidates), EU-Palestine (3 persons), FFEEBB with Egypt (20 people, mostly males, to pursue an undergraduate program in literature) – on the basis of 141 incoming Erasmus Mundus students one can observe that:

1. The countries that promptly responded to the possibility of exchange with Sapienza are Russia and Egypt with large variety in geographic origin – female candidates (69) are almost equal in number to that of male ones (72);
2. The major number of the candidates who came to Sapienza are bachelor students (33), followed by graduate students – master or doctoral (15 in both categories), while the full-degree students are mainly those of the Master's students (59);
3. The more attractive departments are Civil Engineering (35), Economics (32) Letters (26).

The corresponding data for the incoming students available for the year 2012-13 (73 people) show the same trend;

1. In the head of the list are Russia (23) and Egypt (16), majority of females (43) over the males (30);
2. the majority of the students are Bachelor students (16), compared to the full-degree students or Master students (25);

3. Among the most popular departments are Economics (26) Engineering (12) Humanities (11).

Of course the new incoming flows correspond to the outgoing mobility flows, since these are interesting processes of exchange and mutual integration, being the real instruments of internationalization Italian and European academic and cultural worlds[17].

[17] Thanks to efficient work of the Department IX – "International relations", run by Antonella Cammisa and Prorector for International Relations and Cooperation Prof. Antonello Biagini the *outgoin* mobility is constatntly increasing: the total of 20 persons (7 under ELEMENT prog.), mainly females (13), Bachelor courses attendants (9).

Interdepartmental Research Centre "Cooperation with Eurasia, the Mediterranean and Sub-Saharan Africa" CEMAS

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Abstract
The Centre pursues the goal of promoting and enhancing research also by an interdisciplinary integration of the skills of the Professors working in various Departments.
Keywords: interdepartmental research centre, interdisciplinary integration.

The Interdepartmental Research Centre "Cooperation with Eurasia, the Mediterranean and Sub-Saharan Africa – CEMAS" no. 4733 was established by D.R. 29/12/2001 at the University of Rome "La Sapienza".

The Centre pursues the goal of promoting and enhancing research also by an interdisciplinary integration of the skills of the Professors working in the Departments mentioned below. The Centre counts on public and private funding for cultural activities related to the following disciplines:

- History and International Relations;
- Development Economics;
- Communication;
- Surgical Science;

- Environmental Biology;
- Development cooperation with the countries of the areas covered by the Center;

The Center today, April 21, 2014 consists of the following departments:

- History, cultures of religions;
- Surgical Science;
- Law and Economics of Productive Activities;
- Environmental Biology;
- Social Sciences (from 14 March 2012);
- Communication and Social Research (from April 12, 2012);
- Institute of Oriental Studies;
- Department of Law, Economic and Philosophical studies;
- European, American and intercultural studies (from 10 July 2013);

The Centre in 2012 promoted several cooperation agreements with the institutions of the countries identified among the main objectives and the following priority activities involving the departments in initiatives supported by funding external to the university. The following projects were carried out:

1. Agreement with the Azerbaijani Embassy to activate a temporary research position at the University (Department of Communication and Social Research);
2. Publication of the series of CEMAS Notebooks;
3. Convention for the opening of the Eurasian Studies Center in cooperation with the Turkish university BAU and appointment of Prof. Fabio Grassi (History, cultures and religions) as director of the center;
4. Implementation of the Project for the Development of a model of microfinance in Uganda coordinated by Prof. Pasca (a project of MAE, Department of Social Sciences);
5. Activation of three two-year research grants supported with funds from the legacy of Prof. Matsuura (Communication and Social Research, Institute of Oriental Studies, Department of Law, Philosophical and Economic Studies);
6. During 2013 the website of Cemas was created by the Webmaster Dr. Antonello Battaglia: centroricercacemas.blogspot.it/.

The following activities were carried out:

1. 20-21 June 2013 – International Conference "Empires and Nations in Europe XVIII-XX centuries". The Conference was attended by 196 scholars as contributors from 35 different countries (Italy, Albania, Armenia, Azerbaijan, Brazil, Romania, Germany, France, India, United States of America, Georgia, Russia, Britain, Australia, the People's Republic China, Latvia, Montenegro, Greece, Slovakia, Netherlands, Sweden, Cyprus, Canada, Finland, Poland, Serbia, Hungary, Czech Republic, Macedonia, Belgium, Ethiopia, Portugal, Slovenia, Turkey) for a total of 30 panels (13 the first day and 17 the second). The Conference was organized under the supervision of 16 members of the Scientific Committee. The working language was English. A volume of proceedings is being edited by a British publisher and the publication is scheduled for summer 2014;
2. July 2013 – participation of the team of Prof. Schirripa to an anthropological research project in Ethiopia entitled. As required by deliberation of the board of directors on 22 May, a research contribution of 500 euro covering travel expenses was granted;
3. September 27, 2013 – international conference "Economy and Culture in the Republic of Turkey". The pedagogical model and Italy's role. (Center for Eurasian Studies BAU);
4. October 2, 2013 – joint conference with Saudi cultural office on the Eighty years of Diplomatic relations between Italy and Saudi Arabia. Following the signed agreement, a research work was started on the sources of the relations between Italy and Saudi Arabia, to be achieved through an external research grant;
5. October 3, 2013 – awarding ceremony of three research grants in Japanese Language and Literature, Comparative Criminal Law and International Relations and Communication as a result of the legacy of Professor Matsuura;
6. 18-21 October 2013 – Participation of CEMAS to the University Fair in Moscow and St Petersburg (Prof. Claudia Scandura).
7. October 23, 2013 – CEMAS involvement and support to the International Cooperation Section of the Foundation Roma Sapienza. CEMAS staff spoke at the round table on the theme "Creating Development" sponsored by the International Cooperation Section of

the Foundation Roma Sapienza, that inaugurated its activities on this occasion;
8. October 28, 2013 – finalization of the Convention with the Embassy of Azerbaijan to finance the TD research position at the CORIS Department. Contextual signature of a pre-agreement with the Embassy for the acquisition of a space at Palazzo Baleani for the establishment of a cultural center with CEMAS. Please find attached a detailed report;
9. October 30, 2013 – meeting with representatives of the French Embassy for the realization of joint projects on the centenary of the Great War;
10. October 31, 2013 – conclusion of the first part of the Uganda project. CEMAS is waiting for the financial statement and the reactivation of the MAE Convention;
11. 31 October to 1 November 2013 – Participation of CEMAS to the international conference organized by the Institute for Strategic Research of the Russian Federation "Russia and the world at the outbreak of World War I (Dr. Natalizia, Dr. Shendrikova);
12. 31 October to 1 November 2013. CEMAS Participation of the Second World Humanitarian Forum in Baku, Azerbaijan (Dr. Pommier, dr. Carteny);
13. November 1, 2013 – publication of the first two volumes of CEMAS notebooks – Fabio Attore, biodiversity on the island of Socotra; GabrielNatalizia, Japan's policy between international influences and communication of power. The point of view of Italy and the documents of the historical office of the army. Publication of the volumes edited by CEMAS – 1) Daniel Pommier Vincelli and Andrea Carteny, Azerbaijan in the Italian diplomatic documents (1919-1920), Rome 2013 (in collaboration with FIRB and PRIN projects); 2) Alberto Becherelli and Andrea Carteny, Independent Albania and the Albanian-Italian relations (1912-2012), Rome, 2013;
14. November 7, 2013 – presentation of the book "The two faces of Turkey" (Center for Eurasian studies BAU);
15. November 18, 2013 – closure of the call for BAU grants deliberated in the meeting of the Scientific Committee of 22 May 2013;
16. November 20, 2013 – presentation of the book of Prof. Luciano Vasapollo, "Tratadode Metodos de Analisis de los Sistemas Economicos. Mundializacion Capitalista y Crisis Sistemica".

DISCUSSIONS

INDIVIDUALIZATION IN E-LEARNING BASED ON THE MODEL "E-TUTOR"

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Abstract
The report presents the main results of the project completed by Tomsk State University for development of the concept of electronic tutor which is aimed at time saving and effectiveness increase of e-learning. The standard functions of distance learning system apart it solves the problems of optimization of educational process carrying out its psychological and pedagogical support, and diagnostics of students for individual educational trajectory modeling.
Keywords: electronic tutor, e-learning, individualization of learning, psychological and pedagogical support, distance technologies.

In recent years e-learning has become an integral component of educational process in higher schools and has been used in all forms of education. The application of e-learning makes it possible to improve the education quality due to use of fast enriching world educational resources and because of use of e-learning elements and distance educational technologies that enable to enlarge the share of students' independent work in the course mastering.

In e-learning environment there arises the requirement for working

out of computerized systems of new generation for educational process support which assist to perform the duties of electronic tutor: maintaining and support of self-education, individual training search, realization of individual educational programs [1].

At National Research Tomsk State University a pilot project "E-tutor" aimed at effectiveness increase of e-learning has been developed.

The objective of the concept development was to design a modern e-learning system of (ELS). Apart from the standard functions of similar systems (registration, schedule, records, announcements, academic curriculum, design and storing of training material, training quality monitoring), it solves the problems of optimization of educational process for time saving and improvement of education quality carrying out its psychological and pedagogical support of educational process, and diagnostics of students for individual educational trajectory modeling.

Educational individualization is the key factor providing the training quality which nowadays is absent in existing ELS, and in projects MOOC (mass open online courses) either [2]. The computerized designing of individual educational trajectories is rather an actual problem which can be solved by means of artificial intellect systems replacing the real tutor. The development of the concept 'E-tutor' and its engineering realization will permit to find out the methods of dealing with this kind of problem.

In the contemporary society the continuing vocational training is being realized in the conditions of time handicap. Today's students are even more often the people combining work, family life and vocational training. The most important factors of training in these conditions become the volume of professional competences, and the amount of time spent for studies. Therefore the modern professional training programs should provide the maximum volume of necessary professional competences within the minimum time period. The goal achievement is possible due to optimization of educational activity functions, such as:

- student's motivation;
- student's educational trajectory;
- student's knowledge and skills control.

Student's motivation to study influences directly on the educational result. The motivation growth to training can be encouraged by means of pedagogical and psychological methods. Consequently, the corresponding experts should take an active part in educational process as well as arrange individual work with each student. But this sort of approach is hard to realize in the conditions of existing ELS, since the corresponding functional is absent.

The psychological and pedagogical diagnostics and correction can be carried out only by tutors' participation with plenty of time and finance expenses. Partial computerization of tutor's functions in ELS will make it possible to solve the students' motivation problem more effectively.

The modeling of individual training trajectory in educational environment influences the training rate and the educational content conformity to psychological and physiological peculiarities of the person. It is necessary to develop such educational environment which embraces multiple choices and to provide the student with the tools for the search of the individual educational trajectory. The existing ELS do not provide in full these requirements. Therefore, the ELS design meeting these necessities is the demand of innovative education development.

The relevant condition of professional competences development is the knowledge control. But the ELS control is frequently realized in the form of ordinary testing. The results of the control, essentially negative, are often not sustained by the mistakes analyses, do not influence the subject content and do not stimulate the student to further improvement. Form diversity of the control, computerized analysis of test results, and the corresponding correction of the subject content and individual educational trajectory are the functions of perspective development of ELS of new generation [3].

There is no doubt that the information system based on artificial intellect cannot replace the real tutor. But it is possible to computerize some of its functions connected with diagnostics, education and methodical support, motivation, and academic work control.

The major task of the developed system in the realization of diagnostics function is identifying student's individual features for model-

ing of individual training trajectory and the assessment of academic work progress by means of the following functions:

- identification of student's individual features (style of training, dominant mode of thinking, etc.);
- identification of student's attitude to studies, his needs, motives, prospects, anxiety and its reasons being caused;
- identification and the analysis of student's experience, knowledge and skills on the course;
- development of individual educational program on basis of the invariant content of the course, the level of academic material and tests complexity;
- diagnostics of student's rate of mastering course content.

The function of education and methodical support is a standard function for educational systems, but in the given development the additional attention is paid to the following options:

- supervision over the students' activity, fixing of periodicity and work time with educational resources;
- detection of the most typical difficulties connected with personal qualities and problems in student's academic activity;
- correction of individual curricula and student's academic activity;
- distribution of working time according to the course content and the student's individual living conditions.

The major task of 'E-tutor' in motivational function realization is stimulation of studies motivation by means of various interactive training methods and forms of encouragement:

- achievements list and students' ratings;
- encouragement of students' achievements;
- simulation of vocational activity by means of computer trainers;
- correction of negative emotional and physical state.

Motivational problems can be also solved with the help of the organization and support of pedagogical communications including joint projects, creation of academic communities, stimulation of interpersonal contacts, integration of the personal educational profile in the

computerized training system through the environments of student's communications (social networks, blogs and etc.).

For the effectiveness increase of the control function the 'E-tutor' must carry out:

- analysis of students' tasks defining the degree of academic success;
- comments of the defects and mistakes made by the students during the test passing and working with simulators;
- correction of students' activity according to test results;
- monitoring of tasks and mistakes.

The offered principles of 'E-tutor' development render impossible the creation of system with similar functions in the form of a universal product which could be easily connected to any ELS or MOOC platform. 'E-tutor' is not a separate module or component of ELS, but it is the especial approach to ELS development in whole, and the complex system of computerization and individualization of academic work.

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ROLE-PLAYING SIMULATION AS A CONCEPT OF UNDERGRADUATE AND GRADUATE STUDENT EDUCATION IN IT

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Abstract
The paper considers benefits of creating a role-playing simulation environment for students of infocommunication technologies majors in terms of improved week-by-week studying behavioral patterns comparing to regular interactive learning environment. Different patterns of week-by-week activity are described along with final grades of students in the role-playing environment.
Keywords: cooperative learning, role-playing simulations, education in IT.

Role activities (or role playing simulations – RPS) creates a relationship model during the learning, similar to models occurring in the future profession or learning environment (including but not limited to the teacher-student relationship) [1-2], allowing to implement social components, reflected in a variety of common cultural competences of Russian educational standard of third and next generations which should be implementer both during bachelor and master studies.

In some cases it is more convenient to select predefined roles known from the literature [3-4] and distribute them among the students; in the other cases – give students a list of roles and allow the selection and changing of roles according to the dynamics of a particular group of students. Degree of autonomy in choosing roles can be

determined by the degree of experience of students in educational activities [4], consequently for undergraduate students it is appropriately to fix the roles for each round of RPS and closely monitor roles rotation; for the master students – provide greater freedom in the choice of roles and in their implementation and rotation. It is necessary to provide some randomness in choosing roles and provide each student the opportunity to try the whole range of available roles; otherwise students tend to take the most familiar role and thus not improving their weaker social skills and mastering additional competences [3].

For undergraduate students RPS was used in teaching the course "Communication networks and systems". In each lecture there were two speakers with 20 minutes reports each, the remaining time was devoted to discussion, additions, comments, which enabled the professor to assess students' ability to work independently with educational and scientific materials, and the ability to participate in and lead the discussion. Report was being prepared during students' self study in the Department's premises with the direct participation of the professor and teaching assistants – mentors (for the most part during or after the laboratory works). The student had to choose 3 days to work in the lab: 1st – statement and formulation of the problem, the study of materials; 2nd day – discussion of the structure of the report with the professor (during laboratory work); 3rd day – preparing presentation slides and checking by professor or assistants.

Preparation of a report demands a large degree of autonomy and a serious intellectual work, which can be summarized the following steps:

- study of the most important scientific works on the subject by the list given by the professor;
- analysis of the studied material, the selection of the most significant facts, opinions of different scientists and basic scientific principles;
- generalization and logical construction of the material in the form of a detailed plan;
- preparation of PowerPoint presentations and writing the text of the report in compliance with the scientific style.

During the lecture, the professor carefully monitors what the student says, and if an error stops the student and explains where he was wrong and why, if it is not done by other students participating the discussion.

Students who are not involved in preparing the report do the "abstract-summary" on the topic of upcoming lecture. This allows the professor to dynamically assign roles during the lecture, presentation and discussion of the report. One oa the secondary available student roles is to ask questions relating to the lecture; in addition to the questions student prepares a detailed answer to them in the form of essay. At least three students should be involved in asking questions. At the end of the lecture 20 minutes are given to discuss the topics presentations, questions and corresponding additional notes. Table 1 and Figure 1 show different behavioral patterns of students during the learning process with use of role activities.

Table 1. Types of the students based on the degree of involvement in role activities.

№ studying pattern	Definition of studying behavioral pattern	Range of course final grades	Average weekly grade	Average final grade
1	Active role performer	4.34-4.86	0.2875	4.6
2	Participant with recurrent activity cycles	2.69-4.26	0.2172	3.5
3	Passive participant	1.43-3.27	0.1469	2.35
4	Non-active participant	0-1.54	0	0.77
Max achieved grade		5	5	0.3125

The method used is designed the way that students in the preparation of the report should examine the subject of the report using the course books and articles. Often in the case of self-training, the students prepare a surface material and did not disclose the engineering and technical part of the lecture. Students prepare materials in the laboratory under the guidance of the professor were forced to study the issue in more detail, which led to a better understanding of materials.

Evaluation of students was depended on their involvement in the

RPS for a semester are given in Figure 2. Students who performed in the primary roles that is preparation of the lectures, or leading a seminar, eventually know more than a secondary role performers and those who took supporting roles. To address this problem for secondary roles is to include additional tasks, such as preparing an essays or abstracts before or after a lecture or seminar.

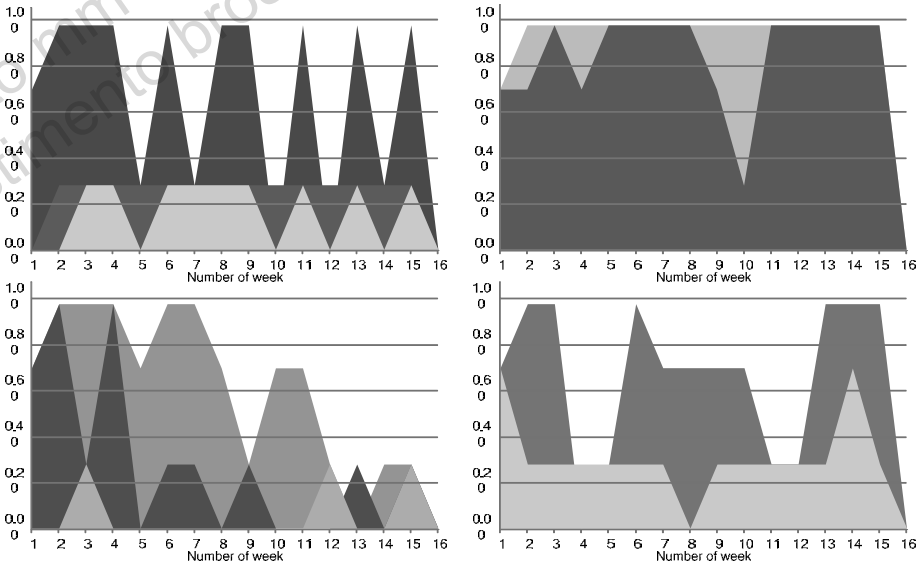

Figure 1. Weekly dynamics of student's involvement in the studying process with role playing simulations.

Also it is recommended to provide a more rigorous plan template for a lecture or workshop or to provide a selection of standard templates, types of activities, encourage the use of active and interactive methods in the discussions and presentations to engage other students in the learning process.

For a complete mastering of a course it is necessary to implement all the competencies relating to the course under study, and 100% attendance is required for each of the students on lectures and seminars, which is only possible with additional motivation for students. For further convenience of the course professor creating an environment for RPS the advantage of electronic educational systems can be taken [5].

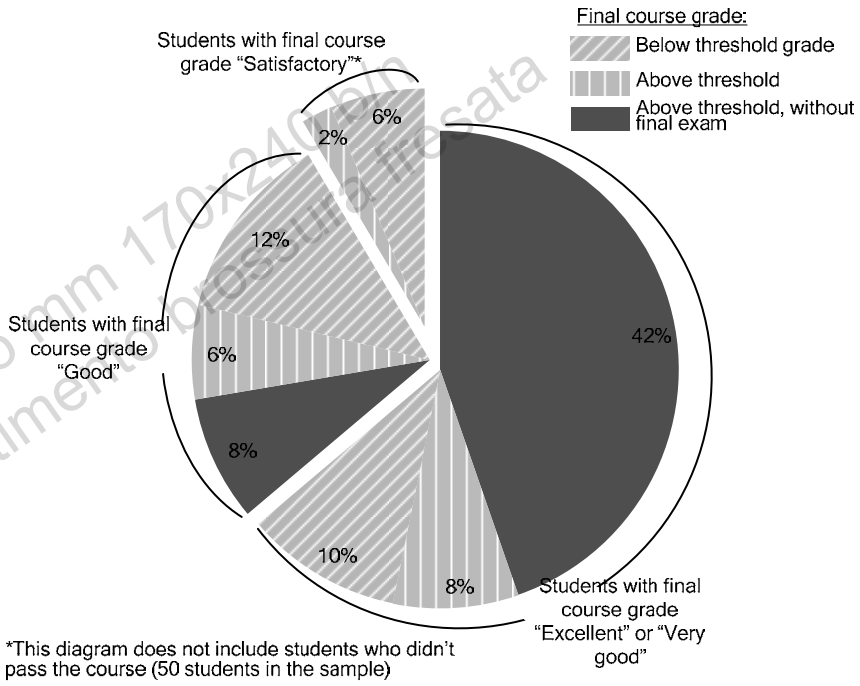

Figure 2. Resulting grades for undergraduate students for course with role-playing simulations.

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AUTOMATING THE EDUCATIONAL PROCESS OF STUDENTS DURING THE SEMESTER

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Abstract
The article describes a workstation students – "Workspace students (WS)", implemented in single corporate information technological platform and automating the educational process of students during the semester. Integration WS with workspaces other educational process participants is described. WS functionality as a single personalized space in which students can receive timely relevant and necessary information about the educational process, as well as interact with other participants is considered.
Keywords: a workstation students, automating the process of interaction between teachers and students, students access to the curriculum, control current and intermediate students' progress, students access to teaching materials in the subjects.

The educational process of students during the semester is a very complex operating system, in which many other participants besides them are taking part: teachers, employees of dean's office, the staff of educational complex divisions and the others. Constant exchange various kinds of information, the volume and variety of which is very large, occurs between students and these participants in this system.

In this regard, the problem of storing, differentiation, quality assurance, as well as obtaining the right time and in the right place this information by students get up in the first place.

Single corporate information technological platform "Organization of distributed information exchange in corporate environment (ODIECE)" has developed and implemented at the National Research University "MIET" (NRU MIET). Platform ODIECE created on the basis of system core "1C-Bitrix: Intranet Portal", and access to it is through the Internet.

Private workstation named workspace for each participant of the educational process has created at ODIECE currently. "Workspace students (WS)" is such a place for students. All participants workspace integrated with each other at the database level, which allows the exchange of information between them, as well as organize the interaction of the participants with each other.

Each NIU MIET student using WS has access to his curriculum in the educational program he is trained since his admission into university and for the current semester. The process of creating curriculum takes place in Management Institute of Basic Educational Programs (MIBEP) workspace, teachers' workspace and employees of dean's office workspace.

Management of university subjects directory (create, edit, delete), the relationship of these disciplines with the chairs, as well as management curricula of students as a set of subjects, ranked by semester with their hours, forms of study (mandatory or elective courses), as well as forms final control occurs in MIBEP workspace [1]. In the case of elective courses information about what exactly each student learns subject entered at employees of dean's office workspace.

Teachers are assigned to these subjects, training and methodological support is added and the structure and schedule of control measures is created at teachers' workspace [2]. Appointment of teachers on subjects is carried for student groups as a whole and for their individual students.

As a result of work MIBEP employees, teachers and employees of dean's office, students in his workspace under "Subjects" on the main page (Fig. 1) have a list of subjects of current and past semesters. Because accumulative scoring system is a system of current and interme-

diate control of student progress in NRU MIET [3], student's total score obtained them for this subject is displayed in the circles of different colors the next to the list of subjects. Red, yellow, light green and green circles with a score match 5-point rating "not satisfactory", "satisfactory", "good" and "excellent" and immediately make students pay attention to their current progress on subject.

Information about penalties and student dates of absenteeism entered employees of dean's office in their workspace also displayed to him on the main page under "Subjects". Depending on the week of learning the list of subjects for which control activities will be held this week, is displayed to student.

Implementing chair, teacher, and forms final control of subject lists in its extended view (Fig. 2). Also in this mode, the student has access to the structure and schedule of control measures on subject, which contains a list of control measures, including its type, week of carrying out and student's score received by him for its execution. Scores of students for control measures are put down teachers in their workspace after their carrying out, which allows students to quickly track their progress during the semester [4]. Also, the process of monitoring, analysis and control progress of students is implemented by employees of dean's office at their workspace which stimulates the systematic daily work of students and activate their classroom and independent work during the semester.

Also in the extended view for each subject the student has access to view and download teaching materials (Fig. 3), such as annotation subject, theoretical material, tasks to practical, laboratory and control measures, etc.

In 2013WS has been implemented and quickly became popular with students in NRU MIET. On average, about 20% of the number of students of all university students are using WS daily. Implementation of the system in the educational process allowed students to receive timely and relevant information about the educational process into a single point of information space, automate some kinds of student interaction with teachers and employees of dean's office. The system is constantly developing and modernized automating more and more aspects of the educational process.

Figure 1. Home page under "Subjects".

Figure 2. An expanded view of subjects.

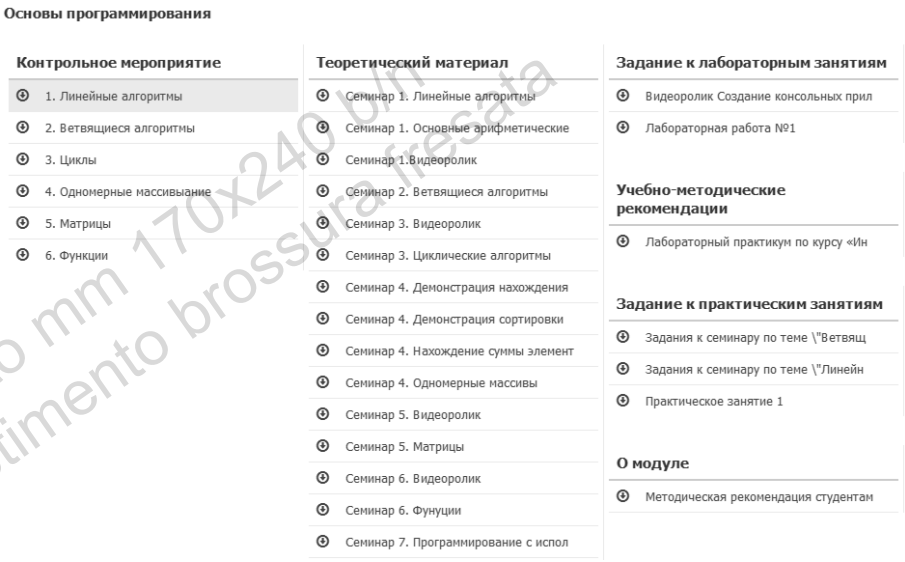

Figure 3. Access to teaching materials on subject.

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DEVELOPMENT OF TECHNOLOGY FOR COGNITIVE LEARNING BASED ON HIERARCHICAL KNOWLEDGE BASES WITH DYNAMICALLY CONTROLLED STRUCTURE

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Abstract
The paper overviews an adaptive intellectual learning system construction method, which founded on knowledge bases with multilevel dynamically reconfigurable hierarchical structure.
Keywords: cognitive learning, hierarchical knowledge base, dynamically controlled structure.

Currently, scope of intellectual information technologies with knowledge bases application is continually expanding. Models and algorithms proposed in this paper can be implemented in an information retrieval system for their efficient operation with hierarchical knowledge base on research, information and control systems and devices design and development, in a remote specialists training processes and in many other areas of scientific and practical activities. And the intellectual learning systems form one of the most sought after area of intellectual information technologies practical application [1].

Automated tutoring quality is practically determined by learning process control algorithm that is based on domain model [2], which,

in turn, can be characterized by entities and relationships between them. In the learning systems concepts or themes can be considered as the domain entities, each of which corresponds to a unit of study material that does not require division into subtopics. Each theme is described by a set of parameters (attributes) that are essential for management of tutoring.

A correlation between subjects *i* and *j* implies dependence between them, which can be interpreted as follows: for subject *j* understanding one need to know the subject *i*. Thus, the correlations can determine a sequence of the subject study. Also the correlation can have different semantics and interdependence. [3]

Let use the graph theory fundamentals to develop learning knowledge base architecture.

Since representation of knowledge base as a graph model corresponds to its logical structure, it is easy to execute its updating and to use effective information retrieval methods. Mathematical apparatus of graph models sufficiently well developed and can be easily adapted for specific knowledge base architectures. Therefore, for architecture modeling of the knowledge base, the model which built primarily on the basis of graphs, and including algebraic, logical and probabilistic methods as components, are proposed [3]. So, mathematical modeling of the knowledge base dynamic structure per the graphs theory, probabilistic characteristics, and the theory of cluster structures is the one of the promising ways of solving this problem.

The graph model of the knowledge base can be constructed as follows. Nodes of graph are assigned information collections (knowledge blocks). Correlations between the information collections are represented by the graph arcs. The correlations represent links to information that might be requested. Nodes of the graph are assigned probabilistic characteristics. For information systems, this means a probability of request for specific documents.

In case of knowledge base model based on a bipartite directed graph it is appropriate to put random number generators at the graph nodes. Working in specified range of values these generators model the a priori information about the modules structure importance and retrieve procedure.

An adjacency matrix is forming for the simulated graph. Instead of values 1, the probability of node request sets into the matrix. The probabilities of request for the graph model nodes (knowledge base modules) are placed diagonally, for example: $P_{i_1 i_1}$ is a probability of request for node v_{i_1} . Nondiagonal elements correspond to transition probability from one graph node into another, for example $P_{i_1 i_1 1}$ is the transition probability from node v_1 into node $v_{i_1 i_1}$, i.e. it is the probability of the documents $v_1 \to v_{i_1 i_1}$ consecutive study.

The probabilistic structure graph model of the knowledge base is graphically shown in figure 1.

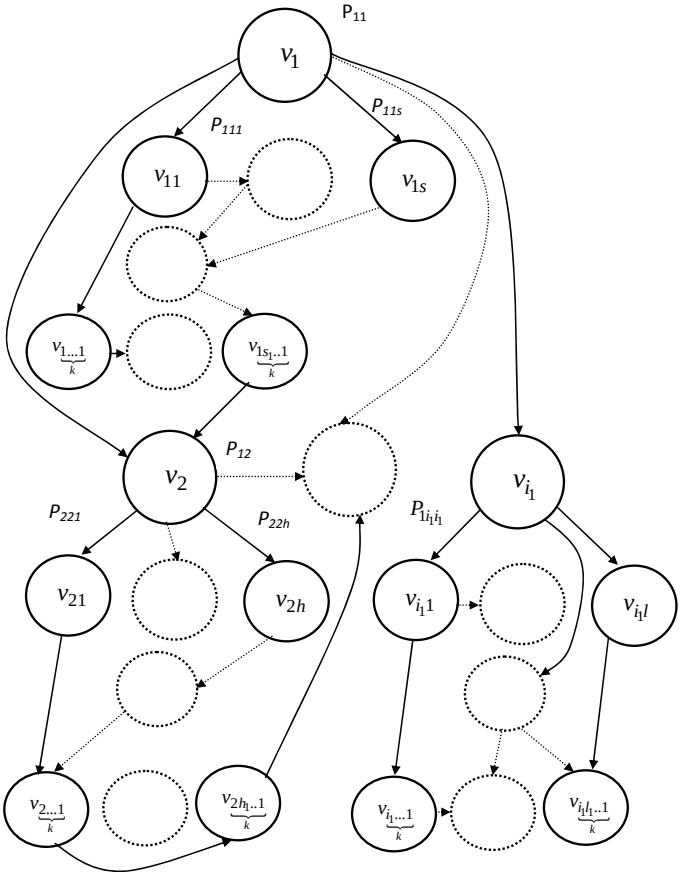

Figure 1. Graph model of hierarchical knowledge bases the probability structure.

Knowledge Base has a multilevel hierarchical structure of the knowledge modules arrangement, but may also use the cross-references for more information or help. The first level of the hierarchy is the highest, it includes modules $\{v_1,...v_{i_1}\}$ comprising the most common nature of the knowledge, i.e. the subjects 1 … i_1. The following hierarchy levels are numbered in ascending number of indexes: $\{v_{11},...v_{1i_2}\}$ – is the second level of the hierarchy on the subject 1; $\{v_{21},...v_{2s_2}\}$ – is the second level of the hierarchy on the subject 2; $\{v_{111},...v_{1i_2i_3}\}$ – is the third level of the hierarchy on the subject 1; $\{v_{\underbrace{n...1}_{k}},...v_{\underbrace{n...j}_{k}}\}$ – is *k*-th level of the hierarchy on the subject *n*, etc. Thus, the lower-level nodes have the longest index.

The knowledge base is dynamically reconfigurable, it means its structure can be changed by adding new modules as well as the probability of nodes (modules) request changing in process of learning. Each node of the graph corresponds a certain number of documents. Then the total probability of request for the documents relating to a single node is equal the probability of request for this node [3].

For example, if the *x*-th knowledge base node (module) corresponds *m* documents D_{xi}, i=1,…, m, and probability of request for this node is P_x, and the probability of request for the *i*-th document is $P_{D_{xi}}$ then

$$\sum_{i=1}^{m} P_{D_{xi}} = P_x \cdot$$

For requests data acquisition arranged a special file-protocol.

Briefly review of learning principles when dealing with the proposed hierarchical knowledge base could be pictured in the following form. At the beginning, a list of the main subjects of the domain model (i.e. the first level modules) are prompted the user. Next, the user creates a search query, the search engine starts, relevant to query documents form the list, where documents arranged in descending order of probability of request for them. The list is stored in the cache, and the user gets a document for the study with the highest

statistical request probability. After learning the document an another one with the next highest request probability is selected from the cache, and so on, until the cache will not be empty. Then, the user is provided for documents relating to the modules on this subject, but has lower hierarchy level. The process is repeated until all materials related to the subject are studied. At the end of learning the user is tested, which resulted in the decision advancing to a new subject, or reexamine the current.

The proposed method implies student's knowledge level accommodation, it's based on an adaptive intelligent selection of the studied materials, and enables the creation of personality-oriented learning systems.

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TECHNIQUE FOR DESIGNING NEW EDUCATIONAL TECHNOLOGY FOR TRAINING (RETRAINING) FACULTY MEMBERS FOR «SOFTWARE ENGINEERING» PROGRAM

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Abstract
The technology of educational process design for raising lecturers' qualification is proposed, the structure and content of three retraining cycles in the area of "Software Engineering" differing with the duration and level of complexity is developed. The set of quality criteria for retraining educational technologies was developed.
Keywords: qualification raising, retraining, modern educational technologies, lecturers, Software Engineering.

To implement an integrated multi-level system of bachelor's and master's degrees in Software Engineering it is necessary to attract highly qualified faculty members (lecturers) who are ready to provide the most important success factors for the organization of the educational process. These factors include systematic approach to the construction of the educational program, increase the use of new information and communication technologies (ICT), modernization of organiza-

tional, methodological and information support for basic and additional training programs for highly qualified personnel in the direction of "Software Engineering". Under these conditions it becomes very important to develop and implement lecturers training and qualification raising (retraining) programs. This retraining must allow them to raise their qualifications in the subject area and at the same time teach them to reach new goals in planning educational process in the modern conditions of higher education.

Based on the analysis of literature and practical experience [1-2], as well as the recommendations proposed in [3-5], a technique of lecturers retraining must include the following basic steps:

1) to form a set of lecturers' competencies based on requirements for specialist in the area of software engineering including lecturers' fundamental, professional, educational and innovative special skills;
2) to develop and select content for lecturers retraining courses based on requirements for specialist in the area of software engineering that provides building specific skills and defining the areas of activities in accordance with the qualifying characteristics.
3) to distribute selected and integrated retraining courses content between different retraining programs in accordance with the specific of a particular lecturer retraining plan based on levels and profiles of his or her students;
4) to distribute educational material (retraining content) selected for "Software engineering" programs between integrated sets of subjects which must be implemented as specific training courses according to the level of complexity of studying them and interdisciplinary connections;
5) to restructure all the basic components of lecturers retraining process using the target-oriented approach.

Three cycles of lecturers retraining program in the area of software engineering are proposed. Methodological apparatus of these cycles provides sets of lectures,, practical work, individual work of lecturers-students, consultations and final certification in the form of testing and final project defense.

Cycle 1 (74 hours, 10 days) is essential for lecturers who train undergraduate students. It includes lectures on the basics of modern methodical teaching, software engineering methodology, etc., training

practical work and. Cycle 2 (108 hours, 14 days) is an advanced course for lecturers. At the same time it is a main course for lecturers who train students for master's degree (Fig. 1).

Cycle 3 (144 hours, 18 days) is an advanced course for lecturers and includes the whole cycle 2 and a special training course for each master's program profile.

A system of criteria for qualitative evaluation of educational technology for lecturers training and retraining was developed. These criteria are combined into the following groups:

1) the presence of highly qualified in the field of software engineering tutors-experts with the skills of providing master classes;
2) lecturers-students' response to training (is evaluated during the courses or immediately after their completion; this provides feedback between lecturers-students and course leaders);
3) training or retraining results which are evaluated either immediately after completion of the course, or after a time when lecturers-students master acquired knowledge, skills, abilities and begin to use them in practice;
4) the impact of these results on university providing bachelor's and master's "Software Engineering" programs. Evaluation is provided after a while and is the most difficult because experts need to find out what changes have occurred in the educational process and whether they are due to the results of lecturers training and retraining educational technology use.

Thus, we can conclude that the technique of designing new educational technology for training and retraining lecturers in the area of software engineering must be based on the active involvement of each participant in the process of studying courses. The proposed content of cycles allow lecturers-students effectively combine methodological, theoretical and practical training with self-mastery methods in professional and educational activities using master classes. At the same time, the use of a common theoretical base and cycle structure allows to build individual learning paths depending on passed cycles and selected training profiles. To successfully use the results of training it is necessary to provide conditions for active creative expression of lecturers and application of their theoretical knowledge and practical skills.

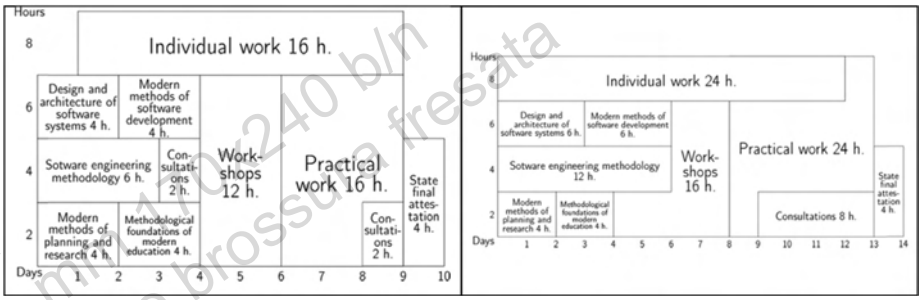

Figure 1. Cycles 1, 2 content.

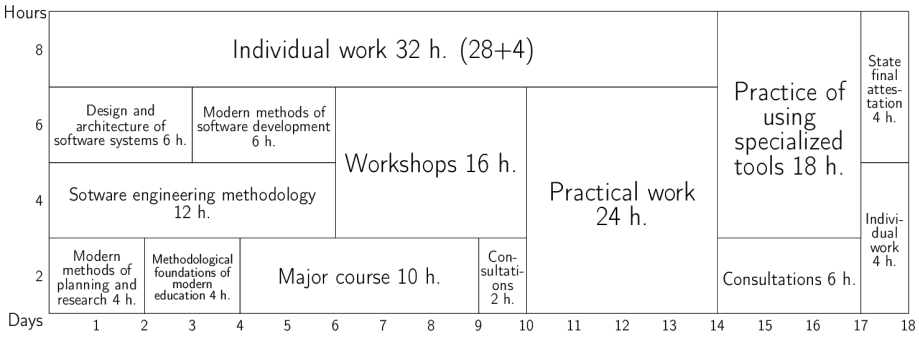

Figure 2. Cycles 1, 2 content.

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PERSONALITY DEVELOPMENT IN ICT-BASED VOCATIONALLY ORIENTED FOREIGN LANGUAGE EDUCATION

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Abstract

The paper deals with major changes in the professional activity of engineering professionals caused by the information society making new demands to their professional competences and particularly to their foreign language communicative skills. Concepts of virtual socio-cultural professional context and foreign language professional socio-cultural competence are introduced. An integrated approach to the information and communication technology (ICT) – based vocationally/professionally oriented foreign language education aimed at the personality development of students as subjects of culture and intercultural professional communication is proposed.

Keywords: modern engineering education, information space, professionally relevant foreign language skills, virtual professional societies, socio-cultural context of profession, foreign language professional socio-cultural competence, integral approach to ICT-based professionally oriented foreign language education, personality development of students, cognitive and metacognitive skills, autonomy of students as foreign language learners and professionals-to-be.

Modern society radically changes demands for education of contemporary engineers. Scientific components of engineering activities are becoming increasingly significant, professional skills of engineers incorpo-

rate economic and ecological aspects, and as a result they have to design complex systems containing not only technical but non-technical subsystems as well. This creates new requirements for engineering mentality, which should be based on highly-developed general culture and reflective skills allowing them to critically perceive their own activity.

As a consequence, engineering education must ensure student's creativity, ability to confidently orientate oneself in the information space, to do independent research, and effectively communicate with representatives of other languages and cultures.

Changing its aims engineering education inevitably changes its contents.

Particularly, in order to reach the aims outlined above, knowledge engineering education gives to the students should be directed not towards the past, but rather towards the future, being able to ensure the so called 'outpaced reflection'. It means that the so-called subject-ontological pattern of engineering education should be replaced for the epistemological/gnoseological one, with the focus on methodological aspects, cognitive instruments, and technologies of instruction that shape students' ability to confidently and independently solve professional tasks on integrative basis.

Foreign languages are a necessary component of engineering education because foreign language skills help future specialists to develop their communicative readiness, abilities for self-education, orientation in the information space and membership in professional communities. Providing all this, foreign languages ensure professional competence of technical students, their professional and general culture. That is the reason why professionally relevant intercultural communicative skills are considered to be an integral part of professional competence of engineers of various specializations.

As virtual environment is playing a more and more important role in the professional activity and communication of modern engineers, the same way as modern society is becoming virtual, the Internet is changing professional communication to the virtual one.

The Internet creates virtual representation of numerous professional societies/ associations. It means that the information society complies with the activity of virtual professional communities. For

technical universities the most famous professional associations are IEEE (eye triple E) (Institute of Electrical and Electronics Engineers) (http://www.ieee.org) and IEC (The International Engineering Consortium), uniting experts in various fields of science and engineering. Along with this, there are some more specifically-oriented professional societies, such as IMAPS (International Microelectronics and Packaging Society) (http://www.imaps.org).

The major functions of these societies consist in promoting professional competences, increasing the quality of technical education, publishing newspapers and journals, holding conferences, etc. As activities of professional societies are becoming global, their profile is changing to international. Thus they can be considered an element of socio-cultural environment in which professional activity and communication take place. The rules and regulations governing their activity can be considered a constituent part of virtual socio-cultural context of a profession.

A modern specialist in any field of knowledge should be acquainted with forms of activities of societies, their editions, communication style, application rules, etc. As a major part of professional communication between the members of professional societies occur in the English language, in order to be active participants of this communication, engineers must possess necessary communicative skills as a means to be engaged to the socio-cultural context of his their profession. Consequently, these skills should be considered a resource for the English language curriculum.

This results in a concept of a foreign language professional sociocultural competence which implies awareness of rules and regulations governing communication within linguistic and cultural communities formed by activities of international professional societies.

The paper introduces an integral approach to ICT-based professionally oriented foreign language education aimed at personality development of students as subjects of culture and intercultural professional communication.

The basic idea of the approach is the notion that various stages of a foreign language curriculum should be in compliance with various strategies of using ICT, which provide a gradual increase of learner

autonomy and ensure a step by step transfer of control of the learning process to the students themselves. This creates the necessary prerequisites for the transfer from the instruction process totally controlled by a teacher to the fully autonomous leaning process.

Traditionally, scholars in the field of foreign language methodology mark out three stages of foreign language curriculum in non-linguistic institutions of higher education. Each of these stages requires various aims, tasks and ways of ICT application.

To achieve the aims of the first stage preferences should be given to ICT-based means of instruction and teaching materials created within the ideology of strongly controlled computer-assisted learning programs aimed at shaping skills of foreign language sentence structure recognition. The programs of this kind are based on the idea of programmed learning and algorithmic rules. For shaping the receptive vocabulary skills for reading it is recommended to apply lexical computer games.

The second stage requires quite different approaches to the design of computerized materials for foreign language instruction. This stage is aimed at the development of writing, speaking, and listening skills implying much higher flexibility level in the instruction control. Therefore, at this stage the so called authoring instruments are more efficient and thus more appropriate. They allow teachers to create their own teaching materials for developing writing, speaking, and listening skills of students under flexible teacher control of the learning process of with teacher and learner face-to-face contact. Along with this students can use the Internet in their learning.

At the third stage students are allowed to use the Internet more intensively and independently to find authentic professionally relevant information to acquire and create their own speech products within the context of professionally relevant communicative situations. By the beginning of this stage students should already possess the necessary minimum of skills forming the basis of their learning autonomy. These skills should proclaim themselves in the ability of students to formulate aims and tasks, choose topics, organize situations of conventional professional communication based on materials discovered in the Internet.

An essential component of the approach proposed is active participation of students in all methodological and organizational issues in the so-called 'reflective dialogues' which serve a means of developing learner autonomy and assessing the level of its formation. Reflective dialogues are intended to perfect students' cognitive and metacognitive skills as a foundation of their autonomy as foreign language learners and professionals-to-be.

THE IVY LEAGUE AND DISTANCE LEARNING

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Abstract
This article discusses the reasons for changing in the world famous universities' attitude to the use of distance learning technologies. MOOC (Massive Open Online Courses) are used as an example.
Keywords: distance learning, massive open online courses, educational programs, higher education.

On the 24th of October, 2013, it was announced on www.lenta.ru that 'three Russian universities – Moscow Institute of Physics and Technology, St. Petersburg State University and National Research University Higher School of Economics – had become partners of *Coursera'* [1]. The news that online courses by Russian universities will be available through the internationally-known *Coursera* educational system failed to get the attention it deserved in the Russian higher education community. Yet this event is a turning point in the perception of distance learning by the elite Russian universities. Three of the Russian 'Ivy League' universities have joined international educational processes that involve the availability of distance learning not only via 'second league' universities, but also via internationally-known universities whose reputation is beyond time.

Coursera.org is a well-known online education project that has been

in existence since October 2011 and currently offers 626 courses from 108 universities (with Stanford University, Princeton University, Columbia University, Johns Hopkins University, University of Toronto, University of Edinburgh, Duke University and University of Pennsylvania among them) [3]. The project was initially launched by Stanford University professors Daphne Koller and Andrew Ng. The overwhelming majority of the courses is taught in English, but there are also courses available in French, German, Spanish, Italian, Portuguese, Ukrainian, Chinese, Japanese, Turkish, and Arabic. The tuition is free of charge, but the Coursera business model provides for monetization either via sales of university-branded certificates (the initial scheme is that certificates do not bear the name of the university and are signed by a lecturer), or via testing with identity verification; paid-for tuition can also be made available to university students. In the period from January to September 2013 the project generated $1,000,000 through fees for validated certificates paid by students of online courses [4].

There are two other projects – edX.org and Udacity.com – that are equally well-known. The former was launched by Harvard University and Massachusetts Institute of Technology. The latter was launched by Stanford University University professor Sebastian Thrun after 160,000 students had enrolled on his free of charge course on artificial intelligence with 20,000 students gaining a certificate following the completion of the course.

According to *Coursera*, as of the end of October 2013 Russian students accounted for 2 per cent of Coursera students (Russia comes roughly ninth or tenth alongside Australia). The biggest audience is from the United States (roughly 31%) to be followed by India, the United Kingdom, Brazil, Canada, Spain, China, and Mexico. To increase the number of Russian students, in collaboration with the Russian Digital October centre, *Coursera* offered Russian-language translations of courses traditionally available in English. The first course to have subtitles in Russian, the more well-known *Gamification* course by the University of Pennsylvania was launched on the 27th of January, 2014 [1].

In 2014 three Russian universities – National Research University

Higher School of Economics, Moscow Institute of Physics and Technology (MIPT) and St. Petersburg State University – joined the *Coursera.org* project.

St. Petersburg State University announced its Russian-language translation of the course entitled *Introduction to Bioinformatics: bioinformatics in biology and medicine*, yet no launch date was given.

On the 17th of February, Moscow Institute of Physics and Technology (MIPT) made available its course entitled *Electricity and Magnetism. Part I*, with another course, *Modeling of Biological Molecules on the GPU*, planned for launch later on. Both courses are taught in Russian.

The Higher School of Economics announced 9 Russian-language courses: *Financial Markets and Institutions* was launched on the 24th of February, *Fundamentals of Microeconomics* and *History of Economic Thought* were launched on the 31st of March and *Documents and Presentations in LaTex*, *Industrial Organisation*, *Labour Economics*, *Macroeconomics*, *Fundamentals of Corporate Finance, Introduction to Neuroeconomics: How the Mind Makes Decisions* were launched in April. Three more courses start in April: *Understanding Russians: Contexts of Intercultural Communication*, *Public Economics*, and *Key Concepts of Data Analysis*.

The history of distance learning shows a clear division into universities offering distance learning and universities offering traditional schooling. The increased use of information technologies in higher education made the situation change. Modern distance learning technologies started to penetrate the very fabric of traditional schooling. Yet they were seen as a mere supporting element for it. Eventually the time came for classical universities to introduce distance learning as a specific branch of activity. However, the objectives they set did vary, so did modes of distance learning implementation. Some universities offered distance learning replicas of classical faculties, whereas others restricted distance learning to pre-university training, advanced vocational training and staff retraining. For quite a while The Ivy League stood aloof from these processes. Likewise, this also holds true for top Russian universities. Yet, what made elite universities turn to distance learning?

Probably with regard to both the Russian and the Western 'Ivy Leagues' there might be several reasons for this.

First, it is a sense of rivalry among universities for wooing students. Globalization has had an impact on higher education. Today prospective applicants may choose any university in the world, as the language barrier is no longer an obstacle for them, and most top universities are offering courses in English.

Mr. A. Auzan, Head of the Faculty of Economics of Moscow State University in his interview to POLIT.RU said that 'now nearly every school leaver … goes on to university. Yet there are countries with even a higher index if compared to that in Russia, and what we are witnessing in the early 21st century is accessibility of higher education to almost every citizen of a developed country. On the one hand, the students level is getting undoubtedly lower… It is Chinese, Indian and other students from countries where admission rate to universities amounts to 10 against 80 per cent rather than local students who help world top universities retain their leading position. It is this minority that sets educational standards, thus it is rivalry among universities to woo the smartest students. Now the competition is not about inviting the internationally acclaimed, distinguished Professor but rather about attracting the Student as it is the student that is to meet the university requirements. The local students prove unable to do that. They see University as just another year in high school' [5].

So, online courses by 'Ivy League' universities enable a smart and highly committed school leaver to overcome the frustration caused by tough competition to enter a big-name university and build confidence to apply to Stanford, Harvard, Higher School of Economics or Moscow Institute of Physics and Technology. It is Massive Open Online Course (MOOC) whatever the distance learning project.

Second, it is providing for a university's global leadership in research and teaching. Several years ago Massachusetts Institute of Technology (MIT) initiated the practice of uploading course materials to the Internet. Susan Hockfield, MIT President, explains, 'What are we doing this for? We do this with an aim of securing the MIT world leadership in education' [8]. Surely, accessibility of free of charge leading universities' course materials can make the latter the bulk and even the essence of syllabi of other universities.

The third reason was well articulated by Professor Erwin Heberle,

who taught at Humboldt University, Berlin, University of San Francisco and University of Geneva. His view is that 'it is only one who gives knowledge for free that may eventually expect to be well paid for it' [8]. Indeed, online courses by world top universities attract an audience of millions. Yet the courses are completed by much fewer students. Despite this, when the time comes for getting the certificate, with regard to monetization, even a low-priced certificate gets the university revenue.

Uploading online courses by renowned universities is not only an 'exploratory attack' method which gives an answer to the question of whether full-scale distance learning is well worth investing into. It is a form of competition in the world higher education market as well.

Moscow Institute of Physics and Technology, St. Petersburg State University and National Research University Higher School of Economics were the first Russian universities to resort to distance learning in an attempt to respond to globalization challenges in higher education. The challenges include rivalry for smart and highly motivated students and for gaining a competitive advantage in the international higher education market.

So, distance learning offered by world top universities is a blessing to both universities and students. Moreover, it is highly beneficial to society at large as it serves a truly humane end – to enable a person to gain knowledge and acquire skills irrespective of age, location, physical well-being and a whole bunch of other factors that might considerably impede or even prevent the realization of one's potential.

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DUPLEX TRAINING SYSTEM BASED ON E-LEARNING TECHNOLOGIES

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Abstract
This paper is devoted to the development of a duplex training system, based on e-learning technology, providing the possibilities of learning and cognitive actualization of knowledge based on psychological and other abilities of the students.
Keywords: duplex training system, e-learning technology, students' knowledge, communication, education

The current pace of technological development and technology upgrades in various spheres of human activity require continuing education and professional development. Some extraordinary leaders in different organizations in our plant, they are attempting to expend their employee's skill in ordering to manage their strenuous activities in training periods. Solution to this problem is to design and create duplex training system based on E-Learning technologies (DTS), which aimed to advance the efficiencies and qualities of the learning process [1].

In communication theory, the duplex system determines as a link, in which message can be transmitted into the both directions simultaneously. In the context of duplex learning system's analogy indicates to simultaneous interaction "teacher-student" in the central infor-

mation hub. In my opinion, those modern communication channels (Internet, telephone) are not fundamentally novel.

It can be considered as the name of the next step in the evolutionary development ways of communication "teacher-student" that integrates into a single system, every modern communication in the information field, methods and techniques for processing and transmission of information-text, audio, video and multimedia technological principles organization of educational process, taking into account psychological, individual abilities of students as singly and combinational groups. Scheme of the organizational and technical structure of the duplex training system is presented in (Fig. 1). The central part of the system is a server – the information center of the university, containing all kinds of supporting information which is existing educational systems as the distance form.

A new addition to the duplex training system is the system of the teachers (**L. Landau-Russian scientist in physics (1908-1968)*) and that system was ruled in the schools and in the classes like L. Landau's, which is suggesting to form groups for the learner in their own hands, led by teacher-tutor throughout the learning cycle.

Using of three E-learning technologies provide relevant structuring for content of the education sector in general and in particular of each discipline. Such structuring (formalization) is carried out by using the theory of languages, which educated grammars; theory of algorithmic systems, it makes duplex intelligent system more effective but the sense of this system is barely hard to access in real life.

Process management is performed by one of the basic methods: inductive, deductive or abductive. In accordance with the general theory system, management of multi-level hierarchical system is two counter-flows: flow of information and flow of management impacts [2]. Learner, himself may choose training technology by discipline "from general to specific", "from the specific to the general" or permanent alternation data techniques of the study in all disciplines.

Settled task of implementation for training management, in which training management the teacher can generate an individual examination of the particular order of discipline to a particular student in the group; and it is defined as transition to the next lessons, depending on the learning result of the previous steps [2, 3].

Hierarchical learning system is considered in two aspects: qualitative and quantitative. In the quantitative aspect has content of disciplines, it is forming the content of information systems (represented information), which represents in a hierarchical structure. From a mathematical point of view, the content of information hierarchy seems natural restricted language like formatted grammar G: G=(V, Σ, P, σ), where: V – complete dictionary (or alphabet); Σ⊆V, where Σ – a set of terminal symbols; P – a finite set of order pairs of the form (u, v), where u∈ (V-Σ)* и v ∈ V*; σ – initial symbol.

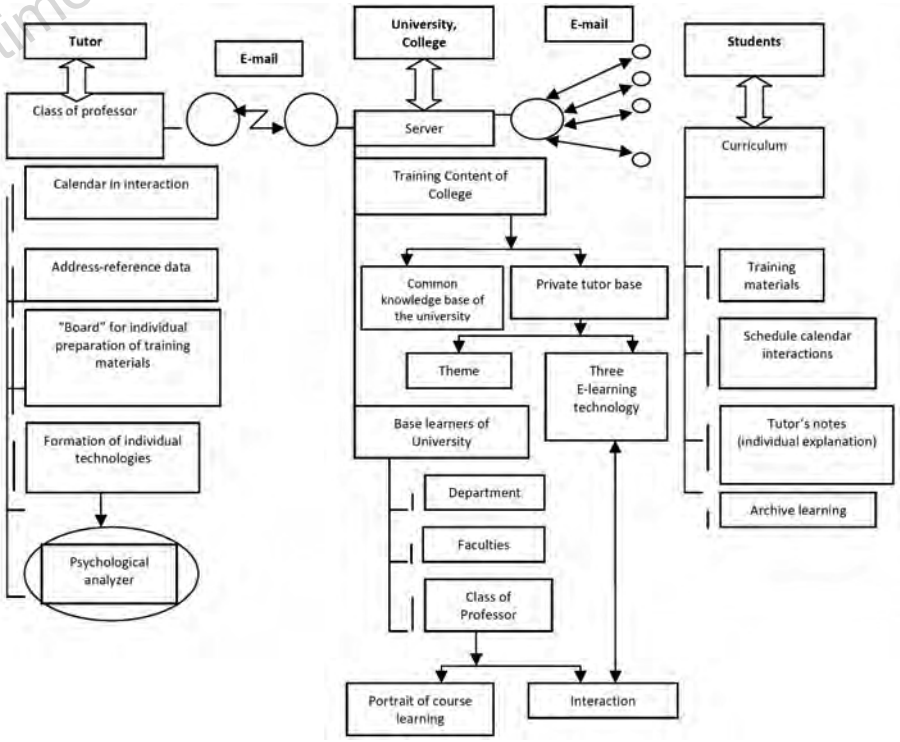

Figure 1. Scheme of the organizational structure and technical of duplex training system.

Creating and presenting the content as language, which formed grammar that not only allows to arrangement knowledge for ensure effective mainstream, and but also it promotes to the implementation of variable control in DTS.

Discipline can be represented triple: $D^U = < V^U, R^U, U^U >$, where VU – set of stages training, RU – matrix of adjacency discipline, UU – algorithm for forming individual learning paths for the discipline. Adjacency matrix R shows the relationship between the stages of studying the discipline and possible transition way from i to step j.

The algorithm for generating an individual learning path is an analysis of the current state of education, student learning outcomes and their further path.

Let $V^U = \{v_1^U, v_2^U, ..., v_{11}^U\}$, where V1U – Elementary stage of education in the discipline. Elementary stage of education is, for example, the theoretical unit, a result of learning in which assessment does not expose or the control unit that consisting of one test task, depending on the correctness or incorrectness of the answer, which will be transferred to the management and to perform the following elementary stages. We define the following values for the elements of the adjacency matrix: 0 – transition is forbidden; 1 – transition in case of an incorrect answer to the control block ViU, 2 – transition in the case of an incorrect answer to the question of the control block ViU; 3 – transition regardless of right or wrong answer to the question of the control block or in case of transformation of a block of theoretical information. Here is an example of the adjacency matrix of discipline:

$$R = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 2 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 3 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 3 & 0 & 0 & 0 & 0 & 0 \\ 2 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 2 & 0 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 \\ 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

Vertices of the graph V_1^U, V_4^U, V_5^U, V_9^U correspond to the theoretical stages of study. Vertices of the graph V_2^U, V_3^U, V_6^U, V_7^U, V_8^U и V_{10}^U – blocks of control tasks. V_{11}^U – the final stage puts the final assessment on the study subjects.

Thus, depending on the level of students' knowledge and embodied in the adjacency matrix structure of the course is carried out taking into account the variability of individual management training, which specify discipline for each group member.

By itself the term "variability" implies participation in the learning process of the student, his personal features and qualities [2]. Therefore, technology management training based on DTS enables the following functions: feedback from the student to the teacher, the ability to store information in the DTS enables to expend in to the progress of learning (the intermediate stages), the possibility of adjusting the teacher training process based on the data on the progress of learning; "flexibility" of the system to learner's action.

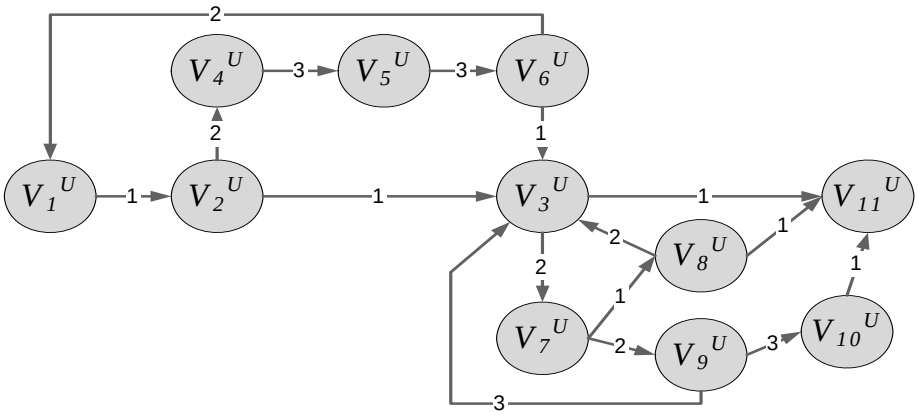

Figure 2. Example for a study course of duplex training system.

The results of application of the developed duplex training system in the educational process of National Research University of Electronic Technology showed that, depending on the training technology provided by increasing of average achievement in 3-13%, reduction in the average time of a student's classroom work by 22-33% and the average time spending with the teacher's monitoring activities at 9-13%, compared with conventional technology.

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THE ROLE OF INFORMATION-COMMUNICATIVE TECHNOLOGIES IN PROFESSIONAL PROGRESS OF STATE AND MUNICIPAL EMPLOYEES

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Abstract

Information-communicative technologies play a key role in the formation of continuous professional training system that enables the selection of educational services with the changing needs of training for state and municipal employees. Information centre is being created in the Orenburg branch of the Russian Presidential Academy of National Economy and Public Administration is open for individual, creative formation of process of learning by state and municipal employees, for independent planning of personal and professional self-improvement. This centre is based on issues of state and municipal service with the use of ICT.

Keywords: professional training system, training for state and municipal employees, system of preparation of the state and municipal employees, efficiency and the reforming of public service.

"The creation of the professional government service" and "the increase of the professional level of municipal employees" are the aims of the government service reformation in the Russian Federation. It is assumed that their achievement is to provide the complex of measures, one of that is the formation of the system of continuous

trade education of municipal employees. Development and introduction of modern educational technologies that plug in it and facilities of information-communicative technologies (ICT) are necessary for this purpose. The openness and dynamic quality of the system, the possibility of educational services choice taking into account the changing necessities of state and municipal employees education are provided due to them.

The necessity of active transition to use modern educational technologies in professional training is emphasized in the Decree of the President of the Russian Federation «About the federal program of public service of the Russian Federation reforming (2003-2005)». However, till now the low level of information competence of the state and municipal employees becomes the factor, objectively braking progress of relationships of authority and citizens, a society as a whole. Vocational training and retraining of state employees in the field of computer science and information technologies, carried out for the last years in the majority of structures of the government, do not give a required result.

The social demand on the high professionalism in government is expressed today in fact that the state employee is expected to use productively modern technologies in the professional sphere, to be adapted to changing technologies, to be able to develop himself, to find effective decisions of administrative problems by means of creativity and innovation while using information in the professional sphere. The role of ICT in the system of higher education and in system of preparation of the state and municipal employees is difficult to overestimate. In educational activity priority significance is attached to ICT development. In these objectives target programs of information technologies introduction are developed and realized.

The new stage of knowledge and skills perception is defined by closer integration of pedagogical technologies, technologies of education and state management with information technologies. It is said of application of modern ICT at all stages of work on personnel structure of bodies of the government and local self-management: the selection and a set on the state and municipal service; an assessment of a skill level, a professional progress of the staff – an assessment of

demand of training, training on all spectrum of educational programs, self-education; an exchange of an operational experience and discussions of burning questions concerning the state and municipal management etc.

Such factors as a course on formation of continuous vocational training system, measures on the increase of government efficiency and on the reforming of public service in these objectives will be defining in these processes. The information-communicative technologies should play the main role in it.

The system of vocational training should be open to the requirements of the continuous education, satisfaction of all subjects demand, overlapping of training and professional work, flexibility and a possibility of training in any place. The appropriating communicative environment assisting the decision of these problems is necessary for this purpose. Thus the internal form of training with the break in the working process is impossible in majority cases. The use of information-communicative technologies provides the way to be trained independently and in own pace and to consider individual requirements. Thus remote training should mesh with introduction of information-communicative technologies in traditional forms of training. It creates the environment of training approached to modern work conditions, the area of independent work of trained people extends and the information capacity of the teaching material raises the efficiency of its mastering.

The flexible information-educational sphere accompanies the worker during his professional process and education. It is capable for scaling, granting of necessary level of knowledge, modeling the process of education etc. Besides it allows automating many processes of educational activity, systems of quality assessment, including monitoring of customers and trained people satisfaction of the educational services.

The information level increase of the basic consumers of educational services – bodies of the government has formed a basis for the new information educational environment creation in the Orenburg branch of the Russian Presidential Academy of National Economy and Public Administration (RANEPA).

The programs of professional skill improvement and retraining of the state and municipal employees through the use of information-communicative technologies were widely developed in recent years. But the activity volume in a direction of additional vocational training of the state and municipal employees is obviously mismatches its potential possibilities. It is a capacious market of educational services in region.

The question of vocational training of municipal employees is a burning one. Municipal formations of small cities, areas and settlements have no sufficient budgetary funds for employees training.

Educational programs are not enough for the effective solution of vocational training of the state and municipal employees problems nowadays. Educational institutions should provide the whole complex of educational, informational consulting and other services.

That is why informational agency concerning the state and municipal service, original multivariate electronic space with databases, electronic mass-media and library, means of interactive interoperability are created on the basis of the Internet-site of Orenburg branch of RANEPA.

Its creation opens the possibility of a more effective solution of the problems concerning the increase of state and municipal management efficiency, the organization of the state and municipal service. The following problems are solving with its help:

- an assessment of workers, a skill level and demand of the state and municipal employees training with the use of special-purpose databases of test tasks on conditions of the removed access. Today the most effective and demanded means of an assessment are the special automated systems. Computer testing has been perfectly proved, as it is deprived of such drawbacks as heterogeneity of requirements, subjectivity of examiners etc;
- generalization, accumulation and providing of access by the state and municipal employees to an operational experience, innovations in area of the state and municipal management. An innovation in management consists of new approaches, technologies, methods, variations of organizational structure of branches of the government and local self-management. The formation of the original

electronic depositaria of the innovative technologies of management applied by authorities should be as a result of this. Creation of special-purpose databases will provide access to the best practices for experts or authorities, etc.

So, the informational centre created in the Orenburg branch of the Russian Presidential Academy of National Economy and Public Administration is concerned to the questions of the state and municipal service in which information-communicative technologies are used as a basis. It is opened for state workers to organize the work and time of the employment, for independent planning of personal and professional development. As a result it should become a social institute which is capable to provide the person different sets of the educational services, allowing to study continuously and to provide a possibility of receiving postgraduate and additional education.

NEW EDUCATIONAL PROGRAMS FOR PROCESSING AEROSPACE AND GEOSPATIAL INFORMATION IN SUAI

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Abstract

The report discusses the features of the new educational programs for processing aerospace and geospatial information in the SUAI. Recently, organizational and technical resources for their implementation and flexible modular structure of programs of additional professional training.

Keywords: higher education, new educational programs, aerospace.

Educational programs for the processing of aerospace and geospatial information are developed and implemented a long time ago. The greatest distribution they received during the preparation of geographers, surveyors, geologists, etc. [1, 2] The aim of these programs is primarily a training specialists who are able to use aerospace and geospatial information for the final results in a particular subject area – maps, charts, etc.

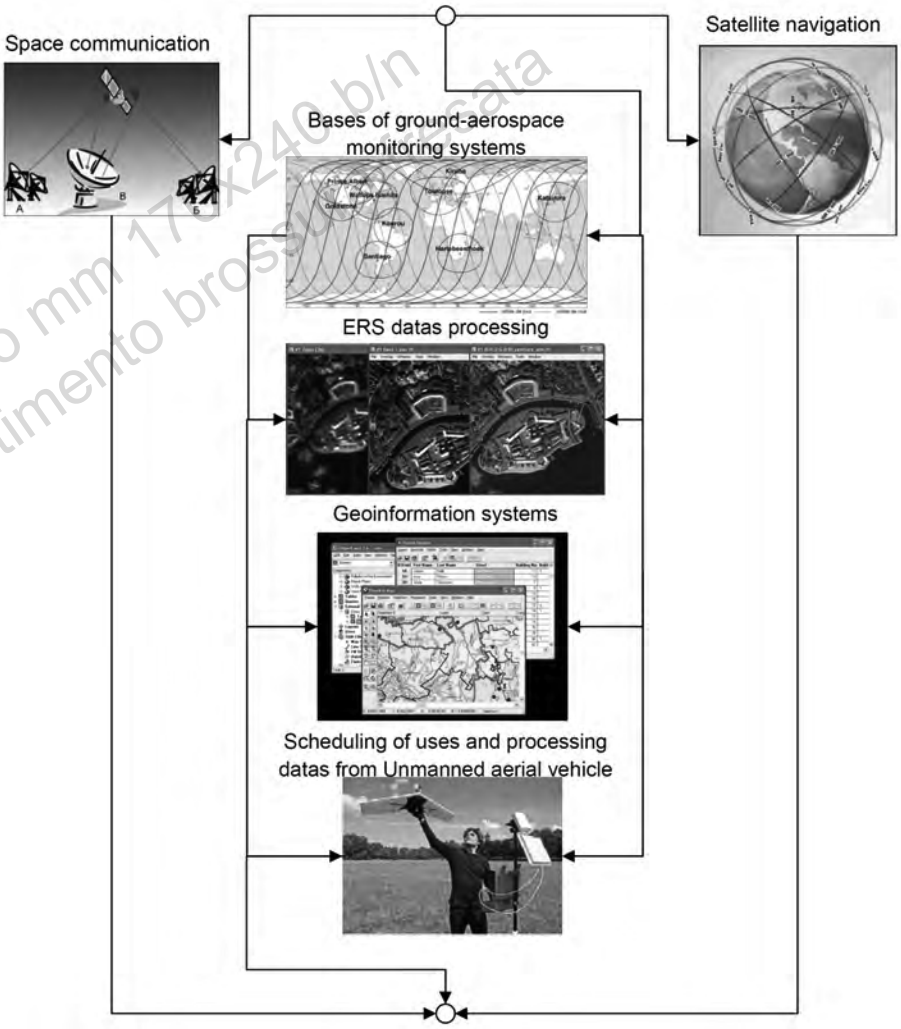
It is completely justified for specialists in these areas. However, for applications need appropriate tools, especially software. The basis for such tools are certain models, methods and algorithms that must be designed and developed. The training of specialists in this field and new educational programs targeted at SUAI.

Models, methods and algorithms for processing aerospace and geospatial information studied under Master's programs "Applied

Mathematics and Informatics", "Software Engineering" and "Computer Science and Engineering." Also on this topic conducted research, graduate and doctoral students preparing for scientific specialty "System analysis, data processing and management."

This approach requires the necessary logistical support and attract highly qualified scientific and pedagogical staff, including performing fundamental scientific research. To this end, St. Petersburg State University of Aerospace Instrumentation (SAC), the St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences (SPIIRAS) and SCANEX R&D Center created Joint Training Center in direct support and involvement of the Federal Space Agency of the Russian Federation, the Government of St. Petersburg, large commercial companies. This center is unique in the Russian example of linking university education, fundamental academic science and Russian business [3].

Picture 1. Joint Training Center.



Picture 2. Modules of additional professional training.

Among the teachers of the Centre: Honored Scientist of Russia, laureate of the Russian Government, the Government of St. Petersburg in the field of science, technology and education, doctor of technical sciences, professor, associate professors and researchers of SUAI and SPIIRAS. Teachers are certified users used in the educational process of the software.

Center classrooms equipped with the necessary hardware, software, including software products SCANEX R&D (Russia), and connected

to the system of access to spatial data from ERS satellites. Additional classes are provided with data from aircraft, including unmanned.

Besides higher education programs Joint Training Center implements programs of additional professional training. Under these programs, training is built in a modular fashion – the list of issues studied and volume classes adapted to the needs of students [4]. Modules and possible schemes of their study are shown in Figure 2.

Adapting to the needs of the audience is not only a flexible choice of modules, but also to adapt to the level of the audience. The listener may have the most initial ideas about the area under consideration, or have none at all. In this case, teaching the basics is necessary. He may already be enough experienced professionals who need to improve their professional competence. Then can go directly to the target module. The listener can be a performer, which should directly handle geospatial information and maintain appropriate systems. In this case it is necessary to pay attention to technical detail. He can be a leader and is primarily interested in the general features and economic benefits from the use of geospatial information.

Besides training professionals, The Center outreach activities to educate secondary school teachers skills performing school projects using satellite imagery.

Thus, in SUAI, on the basis of United training center, a complex of educational programs for the processing of aerospace and geospatial information of different level – higher and postgraduate. They allow you to become a master, and then the specialist of higher qualification, or to complete a professional retraining course in this area.

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USING ICT IN TRAINING STUDENTS OF FOREIGN LANGUAGES DEPARTMENT IN TRANSLATION (BACHELOR'S DEGREE PROGRAM)

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Abstract

The corporate IT platform forms a personified learning environment which intensifies students' learning activities, allows the students to progress at their own pace, helps realize a differentiated approach to training students and provides feedback from students due to communications means. The necessary electronic resources such as electronic bilingual and monolingual dictionaries, terminology databases, automatic editing programs, electronic corpora of parallel texts and online periodicals archives are used at all stages of the translation process, improving the time and quality of translation and making the self-study of students more effective.

Keywords: electronic resources, a differentiated approach, a personified learning environment, student self-study, corporate IT platform.

The Foreign Languages Department in the National Research University of Electronic Technology has been functioning for 15 years. It has been training translators on Bachelor's and Master's degree programs.

The main requirements which are imposed on translation products today – the time of fulfillment and quality of translation – seem to be

excluding each other, but this contradiction can be overcome, partly, by the more extensive use of ICT and programs which allow the translator to improve the quality of the product and reduce time spent on it. Thus, the task of the university is:

- to extend and deepen students' knowledge in the field of new information technologies;
- to build capabilities of future linguists and translators in examining linguistic software products and using them in further learning activities;
- to acquaint students with basics of corpus linguistics, electronic corpora and databases in Russian and foreign languages.

Information Technology implies the process of obtaining new information based on a set of means and methods for primary information processing; a sequence of clear rules of carrying out operations with initial data; and a set of rules, methods and means of obtaining, storing, transmitting and converting information with the help of computer.

Here we would like to focus on the practical use of ICT in the linguistic sphere.

The potential of ICT is so vast that it can be used for studying all aspects of the language: phonetics, lexis, grammar; for forming skills in various kinds of speech activity: reading, writing, speaking and listening; for developing language, speech and communication competency of the students.

University programs of training translators combine in-class activities and self-study of the students. In-class lessons are conducted in a well-equipped computer lab where all the necessary electronic information resources (IR) are available, including:

- word processor;
- electronic bilingual and monolingual explanatory dictionaries (online and offline);
- the Internet;
- terminology databases;
- specialized terminology dictionaries and glossaries;
- automatic editing programs;

- general and specialized encyclopedias, thesauruses in Russian and in English;
- electronic guidelines on stylistics;
- electronic corpora of parallel texts;
- e-libraries;
- online periodicals archives and so on.

Some of these electronic resources have their hard-copy counterparts (dictionaries, encyclopedias, journals), however, they provide much quicker search for information which is updated regularly. Other resources, such as computer translation or editing systems, corpora of texts, terminology databases have no printed alternatives, so their use is indisputable.

The process of written translation of a text includes a number of stages, with different electronic resources used in them.

1. Preliminary analysis of the text. In this stage the students get acquainted with the subject of the text to be translated (it can be a political, economic or technical text), they may improve their awareness of the subject reading the proper entries of the encyclopedia or a textbook in the given field, which will allow them to prevent future translation mistakes. The necessary IR comprise e-libraries, archives of newspapers and journals, they help students find various linguistic and extralinguistic information on any issue, for example, to check the spelling of the name of some politician, to find some realia and so on.

Available IR: Library – http://www.xserver.ru
Russian National Library – http://www.nlr.ru/poisk
Business Week – http://www.busineeweek.com
Economist – http://www.economist
Financial Times – http://www.ft.com
New York Times – http://www.nytimes.com

2. Translation stage. In this stage the students mainly use various dictionaries. Electronic ones make the process of translation faster and more convenient, as the equivalents found in the dictionary can be imported directly into the text. Electronic dictionaries have a number of ad-

vantages: easy access, large volume, regular updating and extending, a possibility of search in a few dictionaries simultaneously and so on.

While translating from Russian into English the students can make combinatory or collocation mistakes, or copy syntax structures of the mother tongue. This problem can be solved by addressing the corpus of the English language and automatic search for the given word combination in the corpus. The electronic corpus is an array of authentic texts of various genres and subject areas. This is the most effective resource helping the translator check their intuition very quickly and reliably.

Available IR: Lingvo ABBYY – http://www.lingvo.ru
Multitran – http://www.multitran.ru
New Big English-Russian Dictionary –
http://www.rambler.ru/dict/enru
National Corpus of the Russian Language –
http://www.ruscorpora.ru
American National Corpus – http://www.anc.org
British National Corpus – http://www.corpus.byu.edu/bnc

3. Editing. The most popular word processer translators in Russia deal with is Microsoft Word which offers a set of tools for editing the text. One of the most important functions which can be realized by the translator using the word processor is checking grammar, spelling and style of the translation. The Spelling and Grammar Checker program draws the translator's attention to possible mistakes and helps correct them.

Available IR: Spelling and Grammar Checker program
Grammar and Style Checker

4. Assessment. In the final stage the resulting text is sent to the teacher by e-mail or through the local network. The teacher checks the text using the Corrections function and sends it back to the student. This function allows the student to see the initial text and all the corrections and additions made by the teacher.

Available IR: Corrections function

The students' self-study activities are also supported by ICT. The university has developed and introduced corporate IT platform ORIOKS which enables the students to work independently. There are complexes of tasks supplied with detailed guidelines, which should be done by students in accordance with the strict schedule. The tasks include various types of exercises, such as filling the gaps with words and word combinations, matching the words and illustrations or audio forms; reconstruction of the sequence (words in the sentence, sentences in the text, abstracts of the text), reconstruction of the text, quizzes, tests, multiple choice exercises, fulfillment of audio instructions, recording student's pronunciation and comparing it with the speaker's, dictations and many others). The tasks are graded in complexity, thus students with different backgrounds can do different tasks or different numbers of tasks. Here we can speak about personified learning environment, which makes it possible to take into account the knowledge and skills gained by the students. While fulfilling the tasks the students use the information resources mentioned above, they also compile their own glossaries and post them for shared use in the Student space on the IT platform.

The following advantages of using ICT in the training of translators can be pointed out:

- better motivation of students, as they themselves can choose the time and the place where it is convenient for them to do their independent self-study work;
- intensification of students' learning activities as the amount of information available to students increases dramatically;
- students can progress at their own pace, which makes them more confident in the outcome;
- differentiated approach to training students can be realized;
- quick feedback from students due to communications means.

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ORGANIZATION OF DISTANCE LEARNING IN HIGHER EDUCATION CULTURE

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Abstract

The article discloses some peculiarities of teaching process arrangement using some elements of distance educational technologies for correspondence department students at the Chelyabinsk State Academy of Culture and Arts.

It is impossible to imagine modern educational process without elements of distance learning. They help to attract more students to educational programs learning. It has also been determined by the development of new informational technologies which can hardly be refused thus making educational institution less popular and cannot meet formal criteria setting up by control systems to educational institution.

In this case higher educational institutions of culture also apply elements of distance and computing education to educational process. The Chelyabinsk State Academy of Culture and Arts is not an exception and has been using these forms of educational activities for ten years.

Students of the correspondence department are mainly among those students where elements of distance educational technologies have been actualized. Thus we may state that usage of these technologies is directed at getting higher education but they are not applied at the refresher training and accessory education courses.

Key forms of distance learning introduced in the Chelyabinsk State Academy of Culture and Arts include interaction of a teacher and students by means of communication nets such as Internet-resources; holding of web-seminars; use of electronic training-methodical complexes, electronic library systems, video – and on-line communication technologies, interactions with students with the help of the Site of the Correspondence learning institute. The Chelyabinsk State Academy of Culture and Arts disposes necessary equipment to hold electronic learning classes for students. At the same time such an interaction of a teacher and students form doesn't abolish auditorium practical classes.

The main accent here is put on foreign students representing mainly the republic of Kazachstan as well as on students living in far from Chelyabinsk cities such as Ufa, Ekaterinburg, Orenburg and Surgut.

The use of distance educational technologies elements in the Chelyabinsk State Academy of Culture and Arts give an opportunity of substantively drop the costs for the arrangement of educational process for the correspondence department students. And what is more it gives many students an opportunity to get knowledge at any time they like without living their home or place of residence.

Undoubtedly, the use of distance educational technologies elements in educational process of an art institute has its peculiarities and complexities. Mainly they are problems connected with the creative specific features of educational programs.

Very often peculiarities of training future musicians, performers, choreographers, painters, designers, actors, directors and other specialists of art culture don't mean the use of modern inter-active and electronic technologies in educational process as they are directed at its traditional, live forms.

However learning facilities of future specialists of creative profile with the use of distance educational technologies elements in educational process are widening, first of all in studying the disciplines of natural science and humanities, the main task of which is to form and increase graduates' general and actual culture level.

THE NETWORK INFRASTRUCTURE OF THE EDUCATIONAL ENVIRONMENT OF THE UNIVERSITY

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Abstract
The article considers informational environment as a means of providing access to the necessary information with a set of intellectual services – a mandatory component of the infrastructure of the university management. There are proposed component parts of network information environment of the university, which will transform it into an effective system that combines innovations in information technology, innovation in management and forms of the organization of the educational process at the university.
Keywords: information environment, electronic pedagogies, integration, network infrastructure, communications.

Education and teaching in the modern information environment suggest some difficulties and challenges as well as opportunities to restructure or re-design a holistic educational process. At the present stage of the university informational environment of the means of providing access to the necessary information is converted into a mandatory component of the infrastructure of the university management with a

set of intellectual services. Without them it is impossible to control the organization and education in the modern university.

In the information society technologies have a strong impact on the information environment of the Technical University, since they imply the emergence of new educational needs and new methodological possibilities. As a result of this influence there are new models of education, in which the roles of the development of teachers and students are modified from different partially installed in the traditional model.

University Infomedia is defined as one side of its activities, including the organizational and methodological tools, set of hardware and software for storage, processing, transfer of information, which is providing quick access to information and conduct educational research communication.

As noted in the work of Seufert, S., Lechner, U., Stanoevska, K [7, p. 49-50], the use of the information environment in the pedagogical model ensures high quality of education, including multi-level technical education, because this approach "allows you to design a convenient and flexible educational environment without the space, distance, or time restrictions."

From the point of view of the developer the information environment of the university represents association of network infrastructure, corporate data, programs and users of the environment. The majority of the tasks facing developers of the information environment, are connected with the word integration: integration of information and technical divisions, integration of network infrastructure of higher education institution, integration of data, integration of appendices, integration of business processes, spatial integration (integration of branches) [6, page 370].

Means of modern pedagogical technologies is provided remote access to the educational resources received for the account of application of information and communication technologies in the educational environment (online-platforms for joint studying, digital library, materials in an electronic format (audiovisual, interactive), the Internet and Internet communities, social networks). These technological resources "are used more and more in engineering education, designing

information space for communication both between students and teachers, and between students" [5, with. 101].

Besides, development of the information environment allows to consider "informal learning" as part of pedagogical process and a pedagogical resource in system of continuous education, i.e. a development of education outside the standard educational environment (individual cognitive activity; the spontaneous education which is realizing at the expense of own activity of individuals in the cultural and educational environment surrounding it).

Thus, research of the information environment of multilevel technical education approaches us to special aspects of educational space, research and design of the pedagogical environment from the multidimensional point of view: content of educational process; modernization of didactic technologies, integration of information and communication technologies, use of educational potential of mass media.

At this Social Software (the social software) [4], allowing by means of the corresponding types of communications to lay the foundation of social architecture of various communities, not only considers specifics of social interactions, but also promotes emergence and development of new forms of social interactions on the Internet.

From the point of view of development of the information environment of technical multilevel education it is necessary to resolve gradually problems of informatization of engineering education, including through evolutionary change of techniques of teaching of engineering disciplines, development of terms framework of "electronic pedagogics", a problem of optimum structure of educational and methodical complexes, etc.

We will formulate some problems of electronic pedagogics which are actual at the present stage of a development of education [2, page 116]:

a) formation and development of theoretical base, including terms framework;
b) types and techniques of carrying out electronic occupations, including remote laboratory practical works;
c) didactic properties of tools (software and Internet services);
d) forms of representation of training materials for studying in the information and educational environment;

e) training of students and teachers for effective mastering technology of electronic training;
f) ensuring quality of electronic training and its assessment;
g) standard legal support of electronic training.

Practice of a number of technical universities, for example in the USA, everything is based on the so-called PLM-methodology (Product Live Cycle Management) which is carried out on the basis of CAD/CAE/CAM programmatically – system support in structure of life cycle of the products, the united concept of so-called parallel engineering – CE (Concurrent Engineering) more widely. This concept of the organization of educational process, to a certain extent, can put in compliance the better known concept in Russia of activity approach [3, page 73]. Its basis is modeling of procedures of activity in the methodical organization of educational process.

The carried-out analysis of foreign publications allowed to reveal key aspects of "dissonance" of the information environment and pedagogical process from developed and applied information environments:

- focus on a content (contents);
- absence strong methodologically pedagogical components;
- concentration on traditional model of pedagogical process;
- combination of various pedagogical tools to the detriment of application "the best pedagogical practicing";
- aren't focused on satisfaction of needs of the employer from the point of view of various subject domains.

In this aspect, in our opinion, the thesis that the main tools, technologies, information (professional area) the circle of the engineer and the student have to be identical is key, i.e. there has to be some "similarity" and comparability of professional and educational information environments that initiates need of development, approbation and introduction of new approaches to development of a technique of teaching of engineering disciplines.

Prompt rates of development of information technologies, their program and hardware often lead to that the specialized centers created in higher education institutions (profile chairs) information tech-

nologies don't manage to synchronize the activity with engineering chairs as there is no mechanism of transfer of innovative experience of activity. Against gradual improvement of situation with equipment of engineering chairs by computer facilities information support of educational process that reduces efficiency of equipment is poorly developed, slows down inclusion of teachers in development of remote education. Such tendency demands professional development of teachers of engineering disciplines in the field of information technologies of professional area of future engineers that will allow to improve quality of training of specialists, will give to teachers new opportunities of professional development.

Development and deployment in educational process of the Grozny State Oil Technical University (GSOTU) of information technologies is carried out according to the state scientific and technical programs in which performance take part as the regional centers of informatization and the research organizations dealing with problems of education and new information technologies, and training centers of leading enterprises of the region. Within research and developmental works the software products representing a complex of modules, united in a common information space were developed, each of which is directed on the solution of certain tasks: CAD/CAM/CAE for three-dimensional design; PDM of system for management, data storage, including engineering (drawings, models and so forth), allowing to operate various libraries [1, page 84].

Introduction of electronic technologies in educational activity significantly changed a form, the contents and process of development of educational and methodical materials on discipline. From the classical textbook and the book of problems transition to the interactive electronic textbook and a practical work, presentations and video lectures on course subjects, electronic tests (including for self-checking), to additional training materials for the organization of independent work of the students, is carried out by GGNTU placed in information and educational space.

For the purpose of transfer of "usual" elements of educational process on information Wednesday the system of standards (the standard on educational and methodical ensuring discipline, the standard on the

equipment of educational audience, the standard on the chair equipment was developed and so forth), the general regulations, rules, templates, monitoring (works of the faculty, completeness and updating of educational and methodical providing) are formalized.

The content, connection, management along with shots and hardware and software, become basic elements of the information and communication environment. And the information environment of modern higher education institution becomes the effective rule uniting innovations in the field of information technologies, innovations in administrative activity and forms of the organization of scientific and educational process in higher education institution.

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On communicative and didactic aspects of mapping an individual study pathway in Electronic Educational environment

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Abstract

The paper dwells on theoretical grounds for mapping an individual study pathway in electronic educational environment. Here, individual study pathway is viewed as a purposeful plan of a person's competence profile. Also, the article points out parameters for designing a model of individual study pathway.

Keywords: individual study pathway, electronic educational environment, competence approach in education, cultural and cognitive profile.

Currently, one can easily state that the major objective of the modern education is to get a person prepared for living in the rapidly changing world with its global-oriented multi-cultural environment. In its essence, global education unites various educational systems and models, based on divergent cultural, religious, philosophical outlooks. Building up a unified educational environment is one of the top priorities for the nearest future. However, this is not an easy task, based on preserving national identity on the one hand, and involving cultural and educational integration on the other. Today's concept of educa-

tion means lifelong learning. These processes cause the knowledge-based approach in education to be gradually replaced by competence-based one.

Nowadays we can witness a number of educational processes migrating into the Internet and, consequently, their becoming more transparent and more ore less multi-cultural [1].

It is obvious that with the application of electronic educational environment (EEE) the didactic functions of a tutor will be changed, and the whole educational process will become autodidactic. And, before mapping an individual study pathway, one must decide how this individualistic approach will be applied in EEE where there is no immediate communication between students and tutors. When studying via the information technologies, a student is supposed to develop individual learning skills and to get well acquainted with the up-to-date on-line education technologies, which means that the student's self motivation becomes a more important factor.

A tutor's role here will be taken by the EEE itself. However, for this purpose it is necessary to select and set the criteria for running individual study process (for instance, a student's cultural and cognitive profile, consisting of the emotional and activities components).

When a student interacts with it, EEE fulfills several important functions:

- Informational, i.e. providing access to various kinds of information, both educational and legal.
- Motivational, i.e. creating and sustaining comfortable environment for the study process, allowing planning and controlling a student's individual activities, as well as a tutor's professional ones.

We believe that, in order to fulfill this individualistic approach to education via EEE, it is necessary to introduce several parts (stages) which will identify the best study method for each student. At the first stage of working with EEE, it is reasonable to run a criteria-oriented testing (a set of tests) to identify a student's cultural-cognitive profile, as well as other basic parameters: motivation, basic knowledge level, information and communication skills, and professional interests. Of course we must take into account the possible interactions between

these parameters and their changes and variations in the educational process. Bearing this tendency in mind, it is reasonable to run re-testing periodically in order to correct the selected pathway. We believe, the received information must contribute to developing an individual study pathway based on the best suitable study technique for each student. Speaking of didactic functions of EEE, we can point out the possibility of the student teaching the system. This may run the following way: the system's intellectual component processes the data received when analyzing the tests and the student's feedback after the courses were complete, and corrects the selected study pathway. Then it collects the statistic parameters to form a data base, thus forming a certain set of tendencies. Later, these collected data can be used for personalizing the study process of further students at the earliest stages of mapping their individual pathways, i.e. for adapting the educational content and its forms to the culture-cognitive profile of each student. The EEE smart content is supposed to be formed according to the output rules, adjusted to a student's culture-cognitive profile.

Of course, the mechanism of mapping individual culture-specific educational pathway of an EEE student can be partially of completely based on tutor guidance.

Also, Individual Study Pathway (ISP) can be mapped and adjusted through recommendation services which will suggest best suitable courses for a student and, if a student decides to take courses outside the recommended range, identify possible pitfalls. Evaluation of task and study materials in the major courses of the education path can be done similarly. Thus, the mastering a course is supposed to follow the path best suitable for a student's information processing skills. We must also point out that this evaluation method can be applied when assessing both major and outside-the-range courses, thus formulating recommendations for the student on how to develop their competence profile on the basis of the courses provided in the system, as well as doing those in free access. Summing it up, implementing the individual study pathway will produce a specialist's competences profile.

Developing and implementing ISP is a complex process that includes the following components [4]:

1. Forming an individual information space.
2. Personalizing educational resources.
3. Personalizing educational objectives and finding meats for their achievement.
4. Adapting educational content and interface in EEEE [2],[3],[5].
5. Achieving synergy effect through combining individual reflection and self-organization capacities.

Designing ISP is a step-by-step (iterative) procedure where the order of its above-mentioned components must be determined on the basis of a student's interim achievements. Developing the whole personalization process is supposed to follow two major directions: vertical and horizontal. In its vertical direction, ISP will consist of operations and activities component, representing an algorithm of achieving the education's objectives. In its horizontal view, ISP represents the "human dimension", formulating and fulfilling the educational processes within EEE.

As an example of implementing EEE principle in the real-life education process, National Research University "Higher School of Economics" (HSE) has introduced Learning Management System (LMS). Its major objective is to improve the quality of didactical and informational maintenance of the educational process both for the students and tutors, as well as for the department management. Implementation of this educational instrument means the students' active involvement in the educational process, stimulating constant student-tutor interaction, both on – and off-line. When running LMS, a user's authentication is essential. A personal set of courses with different access levels is drawn up for each user. LMS provides integration with the unified schedule forming system based on the current study programs, lists of tutors and student, university layout, as well as a student's status (the system includes four such statuses or modules: matriculant, university student, graduate student, post-graduate student). The system automates HSE's interaction with its major client – a student – throughout their whole university life an after graduating. The platform provides vast opportunities for collecting and analyzing information, effective management, conducting and control of the study process. Based on the universalism principle, LMS allows the

following to the tutors: providing the courses materials (storing files, videos, podcasts etc.); managing students' activities for the discipline and checking their performance (running assessment register, checking their projects); using various communication means for the educational purposes (forums, polls). For a student, LMS is becoming more and more important with each step in their educational process. Besides downloading courses materials from EEE, students are also granted access to corporate students' e-mail, on-lone credits records and assessment register for each course, providing them with up-to-date information of their current performance and final marks. As elements contributing to individualizing a student's study pathway, we can point out their ability to choose the courses from the elective options. It is supposed, that the students choose their options with the objective of forming and enhancing their major discipline competences. When applying for a course, a student accesses the discipline's page via his/her personal login in LMS. Despite its containing a vast range of tools and components, we cannot claim that currently LMS is an EEE which can provide for an individual study pathway. It is possible that implementing individualistic and competence-based approach, introducing a more "sensitive" interface, purposeful introduction and synchronization of student-tutor interaction, integrating users' social network profiles and RSS preferences, sending data to the mobile gadgets and other options would contribute to further introducing this system as an important part of the educational process.

Undoubtedly, the problem of mapping students' individual study pathway is currently one of the topical issues in modern education, and, in order to choose the most effective models of designing ISP, a thorough research into the global experience in this sphere is essential.

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An Accumulative Merit Point System: Friend Or Foe

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Abstract
The article describes the accumulative merit point system application scenario and the evaluation system of students educational achievements. The study of the individual activities assessment and their impact on student's motivation were executed. The role of midterm and final exams in the accumulative merit point system and factors contributing to the successful development of the course were presented.
Keywords: merit point system, students educational achievements, individual activities, student behavioral model, teaching load.

An accumulative merit point system for student's evaluation appeared with government resolution [1]. This system was oriented to the student's education monitoring and increasing their motivation to learning. Numerous universities in Russian Federation are using accumulative merit point system for students assessment [2].

The key quality of the accumulative merit point system is the regular studying due to advantage of its results. In theory it increases quality of the education. The ceaseless assessment of academic progress during the term is establish rules for students. They have to do their homework, exercises, studies, etc. Let's look how it would work out in practice. Let's consider tree behavioral model of the students during the term: Student 1 – don't look at the grades student is learning dur-

ing the term; Student 2 – student is missing some activity during the term; Student 3 – student is missing all (or almost all) activity during the term and try to overtake at the end of the term and during the examination.

In our university there are following boundaries for grading students: more than 50 points is "satisfactory" or "pass"; more than 70 – "good", more than 85 – "excellent". Irregular range is could give additional motivation to get better grades. It could give some times wrong belief that using accumulative merit point system will increase students evaluation equity and their motivation for everyday learning, self education and community relief during the term. The success of the accumulative merit point system depends on some issues for professor to use the accumulative merit point system: bottom and upper bound for everyday and final students activity; percentage for labs, tasks and exams. Tree methods of the course evaluating: term grade is prevail; exams grade are prevail and parity graded.

There are two view on the student activities assessment during the term: regular and over regular. In the former the activity is graded every 2 or 3 week while in the latter one or even a half week. The big graininess in the students grading make false success seems. But the final result could be apart from expectations. It appears both via small grades during the term and via tiny grades for everyday students activity with any kind of task and job. For instance students believe that getting 0.5 from 1 point is better than 3 from 5 points. The reason of the illusion is negligibility of 0.5 points at 100 points scales. In additionally without IT in education it could increase a teaching load [3] during the term.

In the first method of the course evaluating the term grade is prevail. Assume all the exams give only 20 points from 100. Students could see all the points that they get during the term and calculate the amount of their effort for revision. In additionally students could decide to be free from the exam if they get their expectations. There is 16 weeks during one term in our university. So students could get maximum 5 points during one week (Fig. 1). The real maximum per week will depends on amount of the "heavy" points activity. It could be practical (workshops) or lab works for course 2 at 4, 8, 12 and 16

weeks. Student 3 obviously fail the course even he/she will get "excellent" on exam. Unfortunately the university rules give chance to students to give in their academical failures during the examination period. Then the student ever so bad in learning during the term he could pass and get the expectations. This doesn't motivate students to learn during the term ex facte. And increase the teaching load at the examination period. In practice we have to repeated the course or its parts for the certain students who decide to learn at their convenience. This work is not additionally paid. On the other hand for professor and for educational process doesn't matter the moment when the student get an expected grade. The same grade at the same course of different students from the different years is just a measure of their competence in this course. But it's not the same teaching load and students load and it should be taken into account while scheduling or making an individual plan.

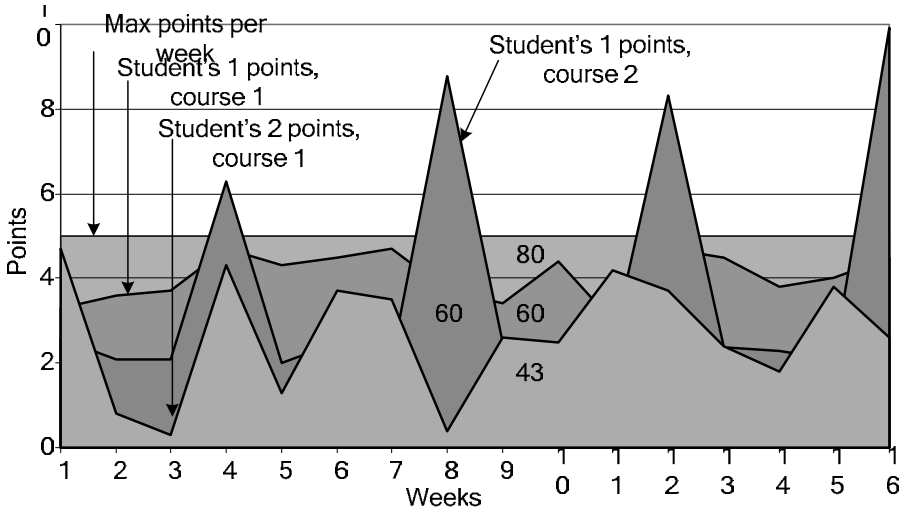

Figure 1. Students points during the term.

We could get the following conclusion from fig. 1:

- For the student who is learning during the term (Student 1) the distribution of "heavy" points activity doesn't affect on final points. It shows that Student 1 steadily get 4 from 5 during the term and even he/she get 20 point on the exam the final grade also

will be "good" (80 points out of 100). In practice it could drop down the motivation to get better grade (excellent). In order to avoid this professor have to offer additional tasks as a part of the course. But it's again increasing the teaching load.

- Student 2 will get "satisfactory" after the exam even he/she miss some activity. Professor could decrease his/her teaching load in case the monitoring activities will be unnecessary.
- Professor have to give points during the term more carefully for the dean's office could react on student's academical failure. That way Student 2 get less than 50 % for the first 4 weeks, but the total points with exam allow him/her to get pass grades. Note that it's unbelievable to get 20 points on exam for the student who fail or miss some activities during the term. But the accurate tuning of the pass points is not so necessary and give a chance to the students and their motivation.

The course could be without exam or test in the limit. From the students it's losing the last chance to get better grade. On the one hand students could get additional tasks at the price of professor's teaching load. On the other hand without the examination period professor could shift the load. But in the view of the foregoing with Students 3 and rights to give in their academical failures during the examination period the teaching load still will be higher. Experience has shown that for the 10 to 15 % of the all group is Students 3 and professor have to spend twice more time than for Students 1 and Students 2.

In the second method of the course evaluating the exam grade is prevail. It's accrue when course have midterm exam (ME) and final exam (FE). As an example 30 for term grade and 70 for exams: 20 is ME and 50 is FE. It's bad with exam stress because students couldn't see all the points that they get during the term and calculate the amount of their effort for revision before the exam. It doesn't contribute to the objective evaluation of students.

Student 1 getting 18 point during the term could get "excelent" if he/she will get expected points at the two exams. But 30 points during 16 week term could lead the same issues as over regular grading. On the other hand student who gets 26 points could get a fail illusion of his/her success and fail the exam.

Student 2 still getting expected grades with probably less effort. Student 3 could get even better grades than Student 2 crushing motivation of the last. Such points set for the course is undesirable.

In the third method of the course evaluating the exam grade is equal to the term grade. The chance to get "excellent" grade for the Student 1 is decreased, but increased chances to get "good" for Student 2 and in the view of the foregoing even Student 3. This points set still couldn't increase the motivation for the students to get better grades. Additionally it gives Students 3 chance to pass the course and decrease the educational quality.

Introduction of accumulative merit point system for student's evaluation in Russian higher education universities can motivate students to place efforts to the courses during the term and to increase the volume of the studied material up to completely abandoning the examination period. Thus professor need to set up points for course that student gets during the semester and for each type of tasks, tests and exams. Decrease in significance of grading every activity as well as partitioning tasks into smaller distribution points can reduce student's motivation. At the same time the regular allocation even consolidation of results on certain periods do not reduce efforts applied by students to study the course. Only reducing the role of the ME and FE able to fully reflect all the advantages of the accumulative merit point system. But any external factors such as forcing professors to additional teaching load for low grade students could negotiate all the efforts of students and professors for the successful development of the course.

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PLUSES AND MINUSES OF DISTANCE EDUCATION

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Abstract

Under the general name "Distance education" the whole industry of educational services appeared and developed successfully, that changed the whole image of education. Internet, constantly developing informational systems and informational technologies produced radical breakthrough in this sphere. Distance learning has become large-scale and versatile phenomenon of educational and information culture which certainly has its own pros and con. Advantages (*Availability and openness, geographical and temporal advantages;* t*echnological effectiveness; flexibility, mobility and freedom of choice; everybody has the possibility to study; individual character of learning; documentation of educational material; distance learning is cheaper than classical learning*). Disadvantages and probles (*Technical and technological problems. Dependence on communication structure; restrictions while choosing mastered profession; The problem of quality control and examination; psychological and pedagogical problems*).

In the process of further development of high-tech industries, modern Internet technologies and information systems in general, problems of realization of distance learning will pass into the category of solved tasks, there will be the possibility to provide realism of the virtual world. Distance education will occupy a leading position in the modern educational environment.

For the last decades the notion "Distance education" has firmly

entered in to the world educational lexicon. Under the general name "Distance education" the whole industry of educational services appeared and developed successfully, that changed the whole image of education. Internet, constantly developing informational systems and informational technologies produced radical breakthrough in this sphere. Modern education is impossible without computers and Internet, neither student, nor schoolmate can do without them. Earlier acquired stock of knowledge was enough for a specialist for the whole period of his work. Today in conditions of rapid information growth a specialist is required to study practically all his life. The idea "education through the whole life" leads to necessity of search of new technologies of study, forms, methods and techniques of knowledge transfer. On the one hand, use of distance learning gives new possibilities for continuing education (getting second and subsequent education), makes education more available. On the other hand, needs for new knowledge, retraining and upgrading develop the potential of distance education. In the world educational space a huge number of courses of distance learning appeared. Faculties of distance education carry out educational activities successfully (for example, faculty of distance learning by Plekhanov Russian University of Economics, Moscow, Russia) and universities of distance education (for example, the Open University of England-OU; the Open University of Israel and so on.). Distance learning has become large-scale and versatile phenomenon of educational and information culture which certainly has its own pros and cons, advantages and disadvantages.

«+» Advantages of distance learning

1. Availability and openness. Geographical and temporal advantages. Availability and openness of education is the opportunity for a person to study remotely from any place in the world, where there is a computer and the Internet, which make the process of learning not only available but also organizationally easier than a classical learning. Create the opportunity to "break" borders not only geographical but also between educational products, expand the possibilities of access to remote individual students. There is no necessity to open new branches in the educational institution.

2. Technological effectiveness

Thanks to the use of modern technical and software tools in the educational process learning becomes more effective, interesting and complete. New technologies make visual information brighter and more dynamical and training will be created by using active interaction of a student with a learning environment. The development of the Internet nets and multimedia of technologies give the opportunity to use different forms and methods of information transfer.

High-tech forms, techniques and methods of teaching (multimedia is voiced videos and slide films, animation; graphics; variety of control and test tasks; rich interactivity, including mathematical models of processes and phenomena; video lectures; video conferences, chat-forum) compensate the lack of direct visual contact. Computer programs which provide training and exchange of data give the opportunity to get in touch with professors and with other students.

3. Flexibility, mobility and freedom of choice

Freedom and flexibility, the access to quality education: new opportunities for choice of a course of training. It can be possible to study at different places at the same time, comparing these courses. Also you can have the choice of the best educational institutions, more effective technologies, and qualified professors, develop the individual training schedule.

Mobility is the opportunity to have a laptop computer with educational materials, lectures and tasks. At any time it allows to apply obtained knowledge in practice, in the process of working activity.

4. Everybody has the possibility to study

Everyone has the opportunity to study regardless of age, status, and character (for example, shy and uncommunicative people, handicapped people and people with other disabilities).

5. Individual character of learning

There is no need to form groups of students like in the classical form of training. There is no dependence of realization of an educational program from a set of listeners (students). Distance learning makes the process of mastering of educational material more individual, opens possibilities for creative self-expression, and gives the tools for

independent work taking into account style of each student and professor. Introduction of distance education reduces nervousness and excitement of students passing tests and exams, there are no psychological obstacles and nothing prevents the student to show his skills. Experience shows that a student who studies remotely must be independent, mobile and responsible. If a student doesn't have such qualities, but motivation for learning is great, so a student must these qualities develop. To the end of his training a student acquires not only the luggage of knowledge, and also earlier mentioned qualities. This increases his chances to be demanded in the market as a specialist.

6. Documentation of educational material

Being trained a student has a curriculum, e-mail correspondence with tutors. Later he can address to them as required.

7. The cost of learning

As a rule, distance learning is cheaper than classical learning by reducing the costs of organization of training courses (reduction of expenses at payment of classroom fund, reduction of a number of staff, reduction of expenses of professors, reduction of expenses for replication of educational and methodical materials on paper and so on).

«-» Disadvantages and problems of distance learning

1. Technical and technological problems. Dependence on communication structure

Distance training requires the expenses for acquisition or creation of information system and introduction, cost of its maintenance. Sometimes it requires additional equipment and higher qualification of users of a computer. Development of an electronic educational content (electronic training courses) requires specific knowledge from all participants of the process. Efforts of a professor who forms the abstract of lectures, becomes insufficient. In the process of creation of high-quality effective training courses other experts should be involved: programmers, pedagogical designers, specialists in video-tape editing, in creation of virtual spaces, animation. It imposes certain restrictions on creation of an educational content. Not all electronic training courses have the necessary level of interactivity (a level of feedback).

If the substantial basis of training courses consists of lectures in the form of text material and simple graphic objects (drawings, schemes, a photo), and control of knowledge only in the form of test tasks, so at such approach to transfer of information the involvement of a student into educational process can't be high, and it will have an adverse effect on assimilation of knowledge and quality of the acquired skills.

2. Restrictions while choosing mastered profession

There are a lot of professions that cannot be taught remotely (for example, the medicine, acting and so on). During mastering of such professions it is important to acquire such skills which can be received only when performing real instead of virtual, practical and laboratory works.

3. The problem of quality control and examination

The majority of distance programs involve the control of knowledge in the form of full-time examination session. And it is right, because it isn't proposed still the optimum technological solutions excluding possibility of participation in control of knowledge of foreign participants. This problem requires special measures, techniques and skills of tutors. Partly this problem is solved with installation of the corresponding software and video cameras at the side of a student that demands certain expenses from the participant of an educational program organizing control and examination.

4. Psychological and pedagogical problems

They are connected with high motivation and self-organization, with the lack of live communication.

Conclusions

Development of distance learning requires the use of new tools and methods of learning, creation of new models of training. In the process of further development of high-tech industries, modern Internet technologies and information systems in general, problems of realization of distance learning will pass into the category of solved tasks, there will be the possibility to provide realism of the virtual world. Distance education will occupy a leading position in the modern educational environment.

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We invite you to take part in

THE II INTERNATIONAL WORKSHOP CONFERENCE «MODERN INFORMATION AND COMMUNICATION TECHNOLOGIES IN HIGHER EDUCATION: NEW EDUCATION PROGRAMS, PEDAGOGIC WITH THE USE OF E-LEARNING AND EDUCATION IMPROVEMENT»

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- **Virtual universities on the basis of E-Learning;**
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- **Modern pedagogic with the use of E-Learning in higher education;**
- **International training Master and PhD programs in Sapienza University of Rome;**
- **Actual ways of improvement of competitiveness of modern universities: integration of educational innovations and scientific research; academic mobility and networking interaction of universities; international cooperation and new demands of the labor market.**

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