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# Advantages and disadvantages of e-learning at the technical university

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## Abstract:

*The term Electronic Learning or e-Learning is being used in Russia rather rarely. It integrates a number of terminological notions in the sphere of application of modern information and communication technologies in education such as multimedia, education on the base of web-technologies, etc. Teachers and learners must realize that new opportunities are offered by modern on-line communication. A person with basic Internet and Web skills is open to a new world of knowledge, from free Web surfing and self-organized education – through on-line resources and familiarization with Internet culture, its places, sites, search engines etc. – up to a more structured approach.*

## 1 Introduction

Among developed countries Russia takes only 55<sup>th</sup> place in introduction of e-learning so far. Since 2005 the leaders of “MATI” have paid much attention to the problems of development and introduction of e-Learning technology into educational process. Among 34 Russian universities taking part in the rating of information technologies in education “MATI” takes only 14<sup>th</sup> place.

Experts say that in future distance learning will become the most popular format in education. As if it is well-designed e-learning allows getting the newest knowledge in any field: on-line text-books are worked out by professionals, the classes can be organized without breaks of job and in convenient periods of the time for a learner. “MATI” has some experience in this field but all attempts still have fragmentary features.

Nowadays e-Learning has become the most important component of innovation, education technologies, especially in the fields of retraining specialists and improvement of professional skills.

It is in fact possible to learn either from downloaded texts and manuals helping to teach student a foreign language with the help of Internet (self-study), either from real Web-based and Web-structured course like the course for former Russian military men, or the external education of distant learning or distant learning for university entrants, at “MATI” – Russian State Technological University named after K.E.Tsyolkovsky. ”To introduce e-Learning technologies widely in the training process of “MATI” is a priority of the present days”, says the rector of “MATI”. Today it is really possible due to the currently working unique Common Information System of the university, supported by corresponding programming and apparatus facilities.

## **2 E-learning as foreign language self-study at the technical university**

The organization of foreign language self-study of the students at the technical university is extremely essential because there are too few academic hours including auditorium work for foreign languages in our curriculums. Information resources of the Internet help to develop the skills for modern professional communication especially in written speech. Due to the Internet the student receive an opportunity to read authentic texts. One of the advantages of such self-study through the Internet is topicality and professional tendency of the information introduced in the Internet. Internet also allows students to create conditions of real professional communication and individualization of the education process. There are three stages in the process. At the first stage of the foreign language self-study in the Internet includes several steps:

- to define the working language of the site,
- to find the plan of the site,
- to find headings of single pages,
- to define how the search of information on the site is organized,
- to find references for other information sources,
- to find references to the search systems,
- to find references for contacts with the site's authors.

The second stage includes the tasks to define the contents of the site. And the final stage allows students to fulfill more difficult tasks, connected with annotation work, writing abstracts, and etc.

The sequence of stages allows learners to form and developing professional skills of mature reading of foreign scientific texts.

## **3 External on-line education or distance learning**

On-line learning combines a high quality of education and the cheapest education at the same time. E-learning is extremely perspective form of education for the vast territory of Russia especially for the far regions. Distance education realizes the main idea of long-life learning: "non-durable renovation of professional skills is necessary in practically all fields nowadays". This kind of external education put forward the main demand to a student: a serious motivation is necessary to self-study. The main source of knowledge on-line text-books will introduce, not a teacher. The communication with a professor in the process of education is realized due to e-mail, on the forum, or during the video conferences.

To realize the conception of e-learning several structures were established in "MATI" such as: Commission of information policy (responsible for united university information base and strategic tasks), Department of information and means of communication (responsible for realization of strategic tasks), Centre of technical means of training (responsible for maintenance of working condition of the whole information system), and finally Electronic Learning Development Centre (responsible for organization e-learning at the university). Solving own problems their common mission is to create and later support electronic training courses and their technological programming and personnel providing.

There are about 8,000 students in "MATI" – Russian State Technological University now, and 300 learners of them are admitted to the distant learning: 73 from Moscow, 123 from Rzev (about 200 km far from Moscow), 75 from Arkhangelsk (about 1200 km) and 8 from Irkutsk (about 6,000 km). The most popular specialties they chose are: Accounting, Analysis and Audit, Organisation Management, Information Technologies and Computing, Enterprise Economics and Management, Marketing. There were even 50 students from Israel

who graduated from “MATI” after Distance Education. The modern communication equipment allowed to design and construct a special classroom for distant education where students could defend their graduation works through teleconferences in the real time.

“MATI” is integrating intensely into international process of interactive computer aided learning. The university took part in two international conferences devoted to the methods and problems in e-learning, such as 2<sup>nd</sup> Moscow international exhibition “E-learning 2005” and 3<sup>rd</sup> Moscow international exhibition and conference “eLearnExpo Moscow 2006”. More than 80 companies from Russia, Austria, Britain, Japan, France, the USA, Hungary, Israel (IBM, HP, SAP, Siemens, Business Services SkillSoft, Novuy Disc, CSSe Train, TNA Associates, Mass Mitec) have presented the newest achievements in the field of e-Learning. Such experience exchange helps to introduce IT into training process.

#### **4 Mixed educational technologies**

E-learning allows to get education to every person out of dependence on its residence or social and economical status. Though today interactive training is more often used to train specialists in economics, humanities, science, and much more rarely in engineering. That’s because engineering education needs technological laboratory practical works as well. But this problem is possible to be solved, for example, with the help of so-called virtual laboratories and distance practical works [1]. But in spite of one more important educational factor still exists necessary to build up the character of a young specialist in industry: the absence of interface communication with a tutor. That’s why we suppose that as far as technical universities concerned it is expedient to combine classical training with e-learning: mixed educational technologies.

Taking into consideration the necessity of mixed educational technologies for engineering specialists in “MATI” The united university information system was created. The system is a foundation to use these technologies in practice. That’s because the system includes programming and apparatus platforms that allows to use it as a universal environment for e-learning in the technical university.

#### **5 Electronic Learning Development Centre**

E-Learning Development Centre was created to speed up e-learning integration system into united university area. That’s not easy because the main deterrent to develop e-Learning in engineering education is the technical difficulty to adopt curricula for engineering specialties orientated towards a large practical component. Besides, there still exist insufficiently developed infrastructure in Russian regions and cultural barriers. They are serious obstacles, either. In spite of mentioned above we are watching high rates of growth of e-Learning in Russia due to:

- intensive development of IT market,
- quick IT introduction in many spheres,
- readiness to changes,
- shortage of highly skilled personnel,
- rather high demands of the Russians for education.

E-Learning Development Centre was created in “MATI” to put into practice the following:

- to train Bachelors and Masters in IT and Computing,
- to train specialists in Viability Safety in Technical Sphere for EMERCOM: Russian Federation’s Ministry of Civil Defense, Emergencies and the Elimination of the Consequences of Natural Disasters,
- to develop and design curricula,

- to provide electronic courses developed by leading specialists of “MATI” with computer programmes,
- to introduce the course “Teacher in e-Learning environment” to help teachers in “MATI” to raise the level of their professional skill.

The Center uses System of Distance Learning (SDL), including:

- electronic textbooks with interactive components,
- forum for communication between students, teachers, and tutors,
- tests to check up knowledge.

Electronic course “Teacher in e-Learning environment” was created to teach tutors to work on line with students through the Internet. The audience get practical skills to work with electronic textbooks, forum, and tests. Also they get to know how to make up curricula for academic courses and to develop tests for these courses. We use interactive components, presentations, lectures, practical tasks, and tests for self-study and review in the course “Teacher in e-Learning environment”. It takes 170 academic hours. The contact information of the electronic Learning Development Centre is [cefo@mati.ru](mailto:cefo@mati.ru) and <https://edu.mati.ru>.

## 6 Conclusion

According to statistics only about 3% of all developed programming providings belong to electronic learning in engineering, and 22% has been developed for subjects connected with IT. It means that in fact, the niche of e-Learning in engineering education in the world is still vacant.

Long-life learning has either advantages or disadvantages. One of the main advantages is that it enables to get new knowledge non-stop. And one of the main disadvantages as learners say is the absence of communication in viva. Discussions, case studies are possible only in real time with internal are possible only in real time with internal students. So suppliers of e-learning need to perfect technologies allowing providing as close feed-back as it are possible. But the full realisation of engineering e-Learning is impossible with the existing state financial policy in education or successful commercial investments.

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