

**19<sup>th</sup> PCSF 2019**  
**Professional Culture of the Specialist of the Future**

**LAW DISTANCE LEARNING TECHNIQUE FOR ENGINEERING  
UNIVERSITY STUDENTS: PROS AND CONS**

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***Abstract***

The article analyses the scientific discussion about the applicability of distance learning techniques to engineering university students as well as it provides recommendations on their further enhancement. By using the example of Peter the Great St. Petersburg Polytechnic University, the authors examine the specific aspects to integrate online and offline education into the system of training students for global academic mobility and application of the smart education system to improve the quality of teaching. In analysing foreign sources, they note that it has become particularly relevant abroad the research into improving critical thinking skills of students through teaching and learning using social networks and cloud computing, as well as techniques allowing correlating distance learning strategies and academic performance of students. The authors highlight strengths and weaknesses of the distance learning while stating that the identified failures of the distance learning method are especially noticeable in teaching legal disciplines to engineering students. Framing the problem, the research contributors propose their own efficient technique for teaching the Law and Copyright and Patenting disciplines. Noting its efficiency, the authors come to the conclusion that along with the improved academic performance of students, the issue is still pending about the disadvantage of the methods permitting to monitor the skills of assimilation and use of special legal terminology within such distance learning by engineering students in their areas of majoring. This enables to suggest the ways for improving the assessment methods for such skills including dedicated computer software.

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**Keywords:** Distance learning, engineering university students, legal disciplines, e-learning, education methods.



## **1. Introduction**

Much attention is given to the issues of introducing methods of distance education in modern foreign and Russian science (Gushchin & Divakova, 2015). In recent years, the feasibility to implement a distance education technique is widely being discussed in the Russian system of education. At Peter the Great St. Petersburg Polytechnic University, as one of the universities that widely apply the most modern innovative technologies in the educational process, while respecting classical educational traditions, a lot of research is also being done on the distance pedagogy.

## **2. Problem Statement**

Most researchers in the field of distance learning technique point out the positive aspects of such learning. One can come through the opinion that distance learning ‘... is the most adequate process of implementing the principle of life-long learning education’, and the use of various video services, for example, in the form of webinars, can be compared with face-to-face lectures and seminars (Andreev & Soldatkin, 2013).

As Nokhrin (2011) notes that the development of the Internet and other means of communication make it possible new forms of the educational process, which are leading along with the classical forms of teaching for already quite a long time – several decades, in a number countries. In this regard, Nokhrin (2011) believes that it is promising to provide everyone with access to high-quality higher education, regardless of their territorial domicile and territorial location of the subject of teaching, while such an open education allows us to take into account the individual characteristics of each human being taught.

However, unfortunately, the distance learning technique has its weaknesses, which, as we see it, are most clearly manifested in the training of engineering university students in the legal disciplines. Such failures include among other things limited opportunities for interaction and consultation between the educator and the student; formal and theoretical nature of education.

It appears that the theoretical nature of education might well be overcome by including practical cases for solving in the scope of information to be learnt. This is the path the leading Russian universities - Moscow State University and St. Petersburg State University, is currently taken in teaching by the main forms of legal education.

The main disadvantage in the implementation of distance education is mentioned so far a lack of face-to-face contact of a student with the educator (German, 2014), the inability to assess whether the student fulfills tasks independently (Pastukhova, Bakeeva, & Gonchar, 2016).

## **3. Research Questions**

The basic questions of the study for the authors to consider include the following: whether there are particularities for applying distance learning methods at engineering universities in teaching of legal disciplines; is it possible to monitor the skills of assimilation and use of special legal terminology by engineering university students, if not, what ways to address this problem exist.

#### **4. Purpose of the Study**

The main research goal as the authors see it is the analysis of current and development of new distance learning methods for engineering university students in learning legal disciplines. This goal determines the formulation of specific tasks: to define the significance of distance learning in the study of legal disciplines by engineering university students; to devise ways to improve the efficiency of the educational process in teaching legal disciplines to engineering university students.

#### **5. Research Methods**

The basic methods applied by the authors were the universal philosophical method, general methods, such as inductive, deductive, method of synthesis and analysis, special methods, such as mathematical, statistical, and logical.

#### **6. Findings**

At Peter the Great St. Petersburg Polytechnic University research is under way so far which is dedicated to the integration of online and offline education to prepare students for a global system of academic mobility (Almazova, Andreeva, & Khalyapina, 2018), the problems of education quality assessment in distance education (Krasnov, Kalmykova, Abushova, & Krasnov, 2018; Necheukhina, Matveeva, Babkin, & Makarova, 2017; Sokolova, Pylkin, Stroganova, & Antonian, 2018). It was also conducted a research aimed at studying the role of distance technologies in the process of teaching engineering students in various disciplines in a foreign language in the ‘... ESP pilot course’ (Kogan, Gavrilova & Nesterov, 2018), on the impact of e-learning on enhancing the quality of engineering and economics students education (Bataev, 2017), the use of smart education system to strengthen the quality of education (Glukhov & Vasetskaya, 2017). A number of studies are focused on the implementation of the method of distance education in relation to the study of the theory of physical culture by students (Bakayev, Vasilyeva, Kalmykova, & Razinkina, 2018), the impact of e-learning on world university rankings (Fersman, Zemlinskaya, & Novak-Kalyayeva, 2017), and the electronic educational environment (Almazova, Rubtsova, Krylova, & Almazova, 2019, Kalmykova, Pustyl'nik, & Razinkina, 2016).

A number of studies are also focused on the development of ‘personal intellectual potential in the conditions of electronic culture’ (Shipunova, Berezovskaya, Mureyko, Evseev, & Evseeva, 2018), issues of managing mass consciousness in the context of developing global information and communication systems (Shipunova, Mureyko, Berezovskaya, Kolomeyzev, & Serkova, 2017), software design issues in the implementation of blended learning (Almazova, Andreeva, & Khalyapina, 2018).

No less interesting is research addressing the development of techniques for improving students' critical thinking skills through teaching and learning using social networks and cloud computing (Thaiposri & Wannapiroon, 2015).

Research abroad continues into the methods and approaches to distance learning for adult students (Kyungmee, Hyoseon, & Young, 2019).

The development of new educational strategies and new methods in distance education has been given close attention by the Dutch scientists. They have developed a technique that allows correlating

distance learning strategies and student performance (Yukselturk, Ozekes, & Türel, 2014). The main advantages of using distance learning technologies often cited in the literature are the possibility of receiving an education at any convenient time for a student with no territorial linkage to a higher educational institution as well as strengthening the objectivity of the assessment of students' knowledge, and economic feasibility (Fertikova, 2017). The possibility of using various cases in the framework of using distance technologies in the educational process is also mentioned, which allows us to simplify the procedure for organizing independent work of students and the work of students in a group, and makes it possible to carry out '... mutual review of completed works on solutions of a case', etc. (Ektov, 2013).

In our view, it seems necessary so far to research into the issue of the applicability of distance learning methods in the study of legal disciplines. In connection with this, it is interesting to look at research aimed at using special educational programs in the educational process, which allow for a deeper study of legal issues, as well as to apply knowledge gained in practice. One of such program is the Smart Learning system, developed by Italian scientists. This program allows citizens, law students and experts, to file an action in electronic form, get legal information on normative acts, as well as receive advice on typical legal issues (Capuano & Totib, 2019). However, we believe that such programs will not be sufficiently efficient for the study of educational disciplines 'Law', since the use of such programs requires an academic approach. Peter the Great St. Petersburg Polytechnic University has experience in the use of distance technologies in the teaching of legal disciplines.

Based on the understanding of distance learning as an interaction between an educator and a student at a distance and being realized through the use of the Internet technologies and other means, the teaching of two subjects in the cycle of legal disciplines implemented by the law faculty members in the field of jurisprudence was tested (Higher School of Jurisprudence and Forensic-Technical Expertise): 'Law' – Institute of Physics, Nanotechnology and Telecommunications (IFNiT) - the first year of study, form of education - full-time, majoring in different areas of engineering, the number of groups 12: (1342 (2); 13433 (2); 13434 (3); 13435 (5)), numbering 297 students in 12 groups - year 2017 and 'Copyright and Patent Law' - Institute of Metallurgy, Mechanical Engineering and Transport (IMMiT) first year evening degree program - 20 students, majoring area - design engineers (54.03.01 'Design') - 2018.

Testing conditions of teaching legal disciplines subjects in the distance mode:

Academic course working program that meets the Federal State Educational Standard (FGOS) v3+ is in place.

The materials for ongoing monitoring were tested at the classes of traditional lecture-seminar type. There were known the issues causing the most difficulties for students.

Delivery term of the distance education course - the second semester of the first year of study.

Number of hours - 3 credits (108 academic hours)

For these first-year students the social studies subject was not the subject to be taken at the Unified State Exam ('EGE') for further study at the university. In fact, there was no systematic knowledge in the field of jurisprudence, or law. Selective survey was conducted at the overview (introductory) lecture (IFNiT).

An example of the questions studied in the course “Social Studies”, to which the students should be able to give answers: what powers include the ownership title, list the elements of a crime, what is a legal entity, etc.

At the overview lecture it was outlined the Roadmap for successful passing the Law course: topics of classes, ongoing monitoring deadlines for delivery of papers, communication rules, measures to be imposed for a failure to meet the deadlines of such ongoing monitoring.

The Roadmap, or ‘credit portfolio’ was available for download through the educational information media – cloud technology on the Internet. The volume: it is desirable that it should be presented on no more than one page and contain brief formal requirements for the papers to be forwarded by the students: 1. Access to the tasks and deadlines (fixed end dates); 2. Basic references, including the rules for access to normative legal acts (basic textbook without copyright infringement) can be made available for educational purposes in electronic form, legal basis - through the official sites of the publication of normative legal acts only; 3. Rules for documenting works subject to submission.

The IMMiT students did not have the Law subject within the framework of the cycle of general education disciplines to be taken. The students graduated from the secondary school from 4 to 5 years ago.

Classroom hours provided (IFNiT) - 4 academic hours for the overview lecture (introductory) lecture, in two streams and two days for conducting intermediate control in the form of pass/fail test at the end of the semester.

The classroom hours provided (IMMiT) - once every two weeks for 2 academic hours for delivery of practical seminars, the lecture material should have been available using the storage and transmission area network - Internet. Intermediate control was envisaged in the form of an exam on the subject at the end of the semester.

Teaching tools used as educational information medium and a tool for the activities of the educator and the student - paper-based case-technology: teaching aids, tasks - are available through cloud technology. The educator maintains communications with students by e-mail, telephone etc. and can directly meet with the students at the consultation hours.

Communication between the educator and students:

- organized through the use of one of the email programs, two email addresses.

The first address is for students' questions (IFNiT and IMMiT), the second address is for sending homework within the ongoing monitoring of assimilating knowledge in the discipline studied (IFNiT).

In the case of the law course, due to the large number of students, professional communications were described very formally in the referred Roadmap, as the material decomposition was based on a module system and within the course of 297 students, six completed Modules had to come to successfully complete the test that is in terms of language of figures were :  $297 \times 6 = 1782$  units of homework tasks; if the module was divided into two or more tasks within the Module, then this figure naturally increased even more.

The strict regulation of documenting the homework for registration allowed us, despite the group method of teaching, to have the update picture of learning the discipline for each student, monitor the progress of each student and the group as a whole, quickly do necessary ‘sampling’ by the educator.

The ongoing monitoring of the progress of the respective group and its individual students was carried out through a table of the results of passing the relevant module and the summary analytical note

on typical errors made by students for elimination in preparation for taking the final test. Summary comments on the results of the work completed on Modules were available through a cloud technology. The deadline for the results to appear in the cloud is about a week after the deadline for the delivery of works of the ongoing monitoring.

By the results of the distance work based on the cloud technology in the IFNiT groups, out of 297 students, less than 4% of students had to take the test in an additional exam session (the result is verified by the number of control papers for taking an intermediate control outside the official exam session deadlines).

The use of distance education by the results of classes given at the IMMiT group has demonstrated that, in general, the students were able to independently master the lecture material with the necessary explanations provided by the educator at the classroom practical seminars.

The intermediate control in the form of an exam on "Copyright and Patent Law" without knowledge of the fundamentals of law with such arrangement of material: in classroom - practical tasks, covering tests, a large number of questions - 20-25 short to each class, as well as solving cases 1-2 individually by each student for each practical class, explanations provided by the educator enabled the students of the group to successfully pass an intermediate control (all students received good ratings).

All guidance and teaching aids on the Law course have been successfully transmitted to Peter the Great St. Petersburg State University's distributed electronic information and educational environment, Institute of Humanities portal: <http://dl-hum.spbstu.ru> to the corresponding courses of the structural unit of the Higher School of Jurisprudence and Forensic-Technical Expertise.

With regard to limited interaction and insufficient counseling, these challenges can be successfully solved using modern computer technologies featuring online courses and e-discussions.

The issue of what qualities should have an educator who applies distance learning technique is often raised in the literature as well. It seems possible to agree with the viewpoint that a teacher in the field of distance learning should have such qualities as '... virtual communicability, flexibility of thinking , ... computer literacy, ... professional mobility', etc. (Turkovskaya, 2011).

In the scientific literature such modern teaching methods are highlighted along with traditional ones as seminars through dialogue with students, participation in discussions, business games, involvement of students in various university and inter-university conferences, delivery of trainings, and simulating litigation experience (Bychkova, Volkov, & Massarova, 2017).

At the same time, the distance learning methods limit the use of such methods as discussion, 'business and role game' and other methods without which it is impossible to implement quality training of the students majoring in jurisprudence.

Out of the significant weaknesses in using distance education for teaching humanities, it is also worth noting a lack of such method of cognition, which distinguishes the humanities from the engineering sciences, as a 'live' dialogue. Obviously, this situation is not conducive to the formation of legally correct oral speech among students. There is no possibility to test knowledge in verbal form, training of written language is applied only and there is no possibility of checking tasks that require reasoning and reflections. To translate them into the language of mathematical symbols is possible, but the process is very labor-intensive and expensive, requires professional skills and abilities of a computer software developer.

One cannot but agree with the opinion of a number of authors that, recognizing the importance of the use of distance learning techniques, it is advisable to use 'blended learning' (Kravchenko, 2014) and the application of distance technology' ... as complementing traditional and methods of the basic form of educating lawyers in testing knowledge, independent work, electives, make-up work if classes are missed' (German, 2014).

## 7. Conclusion

At engineering universities there are preferential opportunities for the application of distance technologies in the educational process. Distance learning has won the right to become one of the most promising forms of legal education for specialists of the future. However, in relation to legal education, distance learning will be most effective if it is implemented as an additional teaching method along with traditional ones.

The research highlights the weaknesses in the technique permitting checking within the framework of distance learning, the skill of mastering and applying special legal terminology, which is used mainly in the engineering and technological sphere of production activity. In this regard, the areas to improve methods for monitoring such skills, including using dedicated computer software are suggested

The research suggests a unique method of teaching the legal discipline - Law in distance form, targeted at engineering university students. This technique allows not only enhancing the overall legal literacy level of students, but also tracking this level with the help of controls developed by the authors.

Thus, distance learning has won so far the right to become one of the main promising forms of legal education, which, however, does not prevent taking into account other innovations in the system of legal education. When teaching legal disciplines, distance learning will be effective on the condition if it is used as an additional teaching method along with traditional ones.

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