

TLIC PAPER

Research Work for Students: Its Peculiarities at Ukrainian Higher Education Institutions under Martial Law

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ABSTRACT

The paper presents analysis of two ways for organizing the research work for students at the Department of Foreign Languages in Lviv National Environmental University: a) the use of modern technologies, robotization of production processes abroad and in Ukraine; b) educational material researched by students from massive open online courses platforms, other electronic resources for students as additional educational materials to the main ones proposed by teachers for the taught disciplines. There are also considered some electronic educational materials implemented for students and discussed by professors of different Ukrainian higher educational institutions at teachers' conferences as well as the ways of spreading the results of students research work and exchanging their experience in usage of the reviewed materials are proposed. Under martial law, the research work for students of higher education institutions of Ukraine should be brought to a new level, especially in the military sphere and for helping our people to quickly restore all spheres of the national economy destroyed during the Russian-Ukrainian war. The results of the students research can be used by the teaching staff for planning and improving the educational process at our and other universities.

KEYWORDS

Ukrainian higher educational institutions, students' research work (R&D), robotization, massive open online courses

1 INTRODUCTION

At Ukrainian higher educational institutions (HEIs) special attention is paid to the organization of students research work (R&D) on the level of the institution, its faculties, departments and other units. The main research conducted by students of various specialties is provided during the writing abstracts of reports, articles, courseworks, descriptions of the results of practices, and diploma projects. Students

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do their research under the guidance of teachers of graduation departments in accordance with the student's speciality requirements.

Most of the results of the research are presented in the form of reports at Ukrainian or international university [1], [2], [3], [4], faculty [5] and department student conferences. The main document on students' R&D at Ukrainian educational institutions is, for example, "Regulations on the Scientific Society of Undergraduate, Graduate, Doctoral Students and Young Scientists at Lviv National Environmental University" (LNEU) [6], that is developed on the basis of the Law of Ukraine "On Higher Education" [7], other documents, as well as the Statute of the LNEU and internal regulatory documents.

The purpose of the Scientific Society activity is to create conditions for revealing the scientific and creative potential of persons studying and/or working at the University, development of their scientific thinking and research skills, development of innovative activity. The main tasks of students' R&D are: mastering the methodology of scientific research; selection of students who have demonstrated the ability and desire to conduct scientific activity; formation of a scientific reserve for further study in postgraduate school, work at departments, research laboratories and other structural divisions of the university.

In the conditions of Russian-Ukrainian war (2014–2023), the scientific work of teachers and students of higher education institutions of Ukraine should be brought to a new level especially: a) in the military sphere; and b) for helping the citizens of cities and villages to restore quickly in the war and post-war period all spheres of the national economy destroyed by the Russian invaders.

The purpose of the research is a) *to describe*: the role and ways of organizing students research work at Ukrainian higher education institutions on the basis of the Lviv National Environmental University [8], its divisions (faculties, departments) and, in particular, at the level of the Department of Foreign Languages (FL); b) *to analyze* our proposed ways for the organization of R&D for students at the Department of Foreign Languages in relation to: a) the use of modern technologies, robotization of production processes abroad, in Ukraine and their future prospects; b) educational material researched by students from MOOC platforms, other electronic resources for students and the searched materials analysis; c) *to consider* some electronic education materials discussed by professors of different Ukrainian HEIs at teachers conferences and implemented for their students, as well as d) *to propose* the ways of spreading the results of students' research work and exchanging their experience in usage of the reviewed materials.

2 METHOD

For the research a descriptive method and the method of comparative analysis were used especially for the disciplines of different specialties for the first- and second-year students at the LNEU faculties as well as for analysis the education materials of distance courses, other electronic resources proposed by professors of Ukrainian universities for different taught disciplines and educational materials from MOOC platforms.

3 RESULTS

In addition to disciplines related to students' future majors, Ukrainian institutions of higher education also offer disciplines of the humanitarian cycle, for example, professional Ukrainian and foreign languages, philosophy and others.

All Ukrainian higher education institutions have departments of foreign languages (English, German, French and other European languages) for teaching students professional vocabulary, communication and translation in the chosen speciality, as well as preparation for passing a mandatory test to determine the level of knowledge of one of the above-mentioned foreign languages during the admission to the master's program of the so-called "Unified entrance exam" in a foreign language; the main one, of course, is the testing of knowledge of the student's speciality, the so-called "Unified professional entrance test."

The teachers of the FL department at LNEU have their own niche, which concerns conducting research with students of various specialities on the basis of foreign literature on the future speciality. The peculiarity of these studies is that they are conducted in a foreign language, the knowledge of which the student deepens during his studies at the University, and speeches in foreign languages (English or German at the department of FL at LNEU) first at the department conference, then at the faculty one [5], and later at annual University international scientific conferences held at our University within the framework of the International Student Scientific Forum "Student Youth and Scientific Progress in the Agricultural Industry" [1], [2], [3], as well as the teachers conferences in Poltava city (Ukraine) [4].

Scientific student groups created at the Department of Foreign Languages provide great help in organizing department and faculty conferences. At the group classes, students master the basics of organizing scientific work, make trial presentations at these conferences [5]. At the above-mentioned student scientific forum (2022) [3], members of scientific student groups at the FL Department prepared and presented 23 reports in English and German, for example: Der Landwirtschaftliche Arbeitsmarkt [3, p. 111], Intercultural communication and its importance for international business [3, p. 349], Translation of Ukrainian folk dumas [3, p. 350], Timber framing construction: historical perspective of the Tudor era and modern buildings [3, p. 530], Benefits of learning English through TV series and movies [3, p. 565], English social media and Internet slang [3, p. 566].

3.1 Research techniques

As it was mentioned above, students do their research in many ways at the Department of foreign languages. Students who do their R&D under our guidance do it mainly in two ways:

The first way is the study of the use of new technologies, including first of all robotics development abroad and in Ukraine in agriculture, construction and other types of economic activity within the framework of specialities offered to students of five faculties at LNEU.

The result of the first way of research, related to the robotization of production processes, can be represented by a student's report on the topic "Robot tractors of the John Deere company: past, present, future" [2, p. 396], which examines the process of formation of this well-known agricultural machinery manufacturer, modern models of robots, ways of their use. One such tractor with electronic control of the John Deere company is used by the students on the experimental fields of the LNEU.

Another example of such a student's report is the topic "Foreign experience in the development and use of construction robots", presented at this year's student conference (October, 2023) at LNEU, based on the Hadrian X robots of the Australian firm FBR and the Massachusetts Institute of Technology (USA).

The second way is the study of the current state and prospects of students' use of educational materials of Ukrainian (Prometheus, LingvaSkills) and foreign platforms (for example, Coursera) mass open online courses (MOOC) and other electronic materials as additional to the main ones (printed and electronic textbooks, distance courses, etc.) for their successful study of the disciplines that are taught to students at LNEU according to their future speciality.

This way of research was proposed for students who have already used at school or are currently using online courses of the above-mentioned platforms, materials from YouTube channels, in addition to educational materials, at lectures, practical classes at our University as well as those students who are interested in the prospect of using the materials of such courses or channels. During the last 2–3 years (epidemic of the corona virus, large-scale war), students were forced, and were able, especially with the help of active use of modern information and communication technologies, to strive more to master the knowledge base necessary for their future qualification, and the teachers mainly consulted student in the process of acquiring new knowledge.

Students were proposed to prepare the materials of their reports based on the study materials for all disciplines that the teachers read to them starting from the first year of study. Students prepare their presentations in Ukrainian and English to make reports at Ukrainian and International conferences.

To be able to compare the research results, first- and second-year students do their research according to the following scheme: traditional introduction, purpose and tasks of the research; use of a list of disciplines that students study during the first or second year; availability/absence of distance courses and other electronic and printed materials on these disciplines at the university; the presence/absence of online courses on the above-mentioned MOOC platforms, which can be used as additional materials for these disciplines; analysis of identified online courses that students use as additional materials to the electronic and printed educational materials offered by teachers; and conclusions.

Ukrainian higher educational institutions began to use actively materials of MOOC platforms as additional educational materials for distance courses before the beginning of COVID-19 epidemic [9, p. 378]. Now these materials are being used more effectively at HEIs.

Administration of Lviv National Environmental University organized installing a new version of Moodle at its server, and newer versions of distance courses were being compiled for students of different specialties at our university's five faculties just before the epidemic and during the full-scale Russian invasion in Ukraine.

It was hard to organize distance learning at the beginning of the epidemic; that is why the simplest means of communication with university students were chosen by teaching staff of our university. For example, for providing English classes at the beginning of the quarantine there were used mainly e-mail or Viber. The study materials were also available on the University website. All students had the opportunity to communicate constantly with their teachers by phone and e-mail, by Zoom video conferencing as well as to use textbooks and printed dictionaries at home. Some students used Ukrainian and foreign YouTube channels for studying English, for example, Easy English with Rostyslav (Lviv, Ukraine) [10], Learn English with Rebecca (USA) [11].

Then the teaching staff of the Department of Foreign languages at LNEU decided to use English online courses from Ukrainian *Lingva.Skills* and *Prometheus* platforms as well as American *Coursera* platform and other electronic materials as

additional educational materials for distance courses, English textbooks, lecture courses, and more.

Lecturers of LNEU usually propose that students research new foreign prospective technologies in different spheres of science and technology as well as other new trends of their development in Ukraine and abroad.

But now because of COVID-19 epidemic and the Russian-Ukrainian war, many LNEU's students began to use different educational materials of MOOC platforms during their studying at high schools and are using them successfully now at our university. Some of them tried to search for the online courses and other electronic educational materials for their specialties and analyzed them in the form of research work under the guidance of teachers. That's why the most-active-in-this-trend students decided to do their research in new additional electronic educational materials to improve their knowledge in different disciplines.

First-Year Student Research. During 2020–2022, the first-year students of the Lviv National Environmental University completed their researches on the specialties “Automotive Transport,” “Accounting and Taxation,” “Information Systems and Technologies” and “Agronomy.” They also made reports about the results of the research at the students’ and teacher’s international conferences that were held in Ukraine. The materials of their reports are published in the Proceedings of the conferences [1], [2], [3], [4].

For example, one of the students analyzed the materials of disciplines, taught by the first-year students majoring in “Automobile Transport” specialty, and alternative learning materials on the platform of massive open online courses “Prometheus” for the organization of blended learning at the Faculty of Mechanics and Power Engineering. He also described the experience and prospects of blended learning of the English language for students majoring in this specialty who have English classes at the Department of Foreign Languages in Lviv National Environmental University [1, p. 397].

The second student analyzed the academic disciplines offered to first-year students of the “Accounting and Taxation” (AT) specialty (Faculty of Economics) and identified the presence of online courses at the Ukrainian “Prometheus” platform, which can be used as additional materials for training students of this specialty.

In the process of research, it was found that, out of 16 disciplines offered to first-year students of the AT specialty, only 4 disciplines (Economic Theory, History of Ukraine, Philosophy, and English Language) are among the online courses of the Prometheus platform. Most online courses are related to the discipline “English language” (English for beginners, Elementary level A1–A2, English for media literacy, English for career growth, and English for business and entrepreneurship). In addition to the mentioned online courses, the Ukrainian platform *LinguaSkills* was discovered. Its online courses can be used for learning English from A1 to B1 levels [3, p. 568].

The third student analyzed the electronic educational materials offered by the teachers of the Department of Information Technologies and other departments of our University in the disciplines that are taught during the first year of the bachelor’s degree in the specialty “Information Systems and Technologies” (Faculty of Mechanics and Power Engineering). She also identified possible online courses that are provided by the “Prometheus” platform and in the Internet in general for further use them in teaching students of this specialty.

At our university, first-year students majoring in “Information Systems and Technologies” study 13 disciplines, including: computer circuit engineering, business analytics, higher mathematics, English, and business in IT.

In addition to traditional manuals and methodical recommendations, teachers of the above-mentioned disciplines offer distance courses in the Moodle virtual learning environment for the first-year students. In the process of analyzing the online educational platform “Prometheus,” online courses were revealed that can be used as the additional sources for studying the four disciplines mentioned above.

This platform provides full courses for such disciplines as “History of Ukraine: Completed course of preparation for the ZNO,” “Philosophy,” “Y Combinator startup school,” “How to create a startup,” and “IT product from scratch: where to start and how to develop?”

A lot of information for studying the disciplines can be found on YouTube channels that provide an opportunity for better understanding the topic “HTML & CSS,” for example the course “Basics of HTML & CSS for beginners.” This course can be used as an additional course for the first-year students while studying the “Fundamentals of Information Technologies” discipline. An interesting YouTube channel is English for IT from Brain TV. The channel offers English lessons for beginners in the field of information technologies [3, p. 569].

The fourth student analyzed the materials of disciplines, taught by the first-year students majoring in “Agronomy” speciality, as well as alternative teaching materials on the platform “Prometheus” MOOC platform for the organization of blended learning at the Faculty of Agricultural Technologies and Ecology.

Educational materials studied by students are placed on the platform of the virtual learning environment of the Lviv National Environmental University. Additional educational materials from the above-mentioned disciplines were discovered by the student on the Prometheus platform. For example, the developers of educational materials of the Prometheus platform offer two intensive online courses in Botany and plant physiology, Agroengineering and Agronomy. These courses have topics that can be used as additional material for studying the disciplines of Plant Physiology, Plant Breeding and others. Among the general education disciplines, two online courses should be used in the educational process: “Modern History of Ukraine: from the beginning of the Second World War to the present days” and “New Physical Culture.” Students can also test their knowledge of these disciplines on the platforms mentioned above [2, pp. 252–255].

Second-Year Student Research. Now the second-year students specializing in “Construction and Civil Engineering” (Faculty of Construction and Architecture) as well as in “Information Systems and Technologies” (Faculty of Mechanics and Power Engineering) are doing their research according to the mentioned above scheme. They are going to expand the list of the investigated platforms because there are many special subjects in their curriculum as well as other electronic resources, for example, YouTube channels.

Besides the mentioned above Coursera platform, there are also popular and used in Ukraine such foreign platforms as CanvasNetwork, edX, FUN, FutureLearn, htmldog, KhanAcademy, MIT, MyEducationKey, OpenCourseware, Open2Study, rubymonk, Udacity, Udemy, and XuetangX. Among Ukrainian platforms, there are well-known platforms such as EdEra (Educational Era), FreeMonline (Free University of Maidan online), and WiseCow (Free video lectures Wise Cow).

The innovative form of learning by means of MOOC platforms gives a possibility to have a free access by means of the Internet simultaneously for many students to almost all or many educational materials of the above mentioned online platforms.

The results of the first-year students’ research were discussed, for example, at the international student’s conferences [1], [2], [3], teacher’s conferences [4] and were summed up in our report at the international conference in Fergana (Uzbekistan)

[9] in 2022; the second-year research – at the same conferences in Lviv, Poltava and were summed up in New-York (USA) [12] in 2023.

3.2 The Ukrainian higher education teaching staff research

The results of implementing online courses in educational process are discussed by professors of LNEU and other universities, at Ukrainian as well as International conferences that are held at Ukrainian universities [1], [2], [3], [4] and abroad [9], [12].

At the conferences, besides implementation of educational material of MOOC platforms, other electronic resources were discussed that can be used in educational process. For example, at the International conference *Topical Issues of Linguistics, Professional Linguodidactics, Psychology and Pedagogy of Higher Education* [13] in Poltava (November 24 and 25, 2022) YouTube channels were discussed: Latinitas Animi Causa, Latintutorial, Polymathy (13, pp. 146–149) and other resources.

At the conference *Topical Issues of long-life education in information society* [14] in Kyiv (May 29 and 30, 2020), social network (Facebook) and messengers (Viber, Telegram) for communication with students (14, pp. 99–100), geoinformation resources Google, online services Google Earth, Google Maps, Google Art Project (14, pp. 100–102), and others were discussed.

At the conference *Interaction of Language Units: Communicative and Cognitive, Sociocultural, Translation and Methodological Approaches* [15] in Kyiv (April 22, 2020), mobile learning (iPods, cell phones, iPhones), blogs, online quizzes and tests, instant messenger, internet telephone Skype, teleconferences (15, pp. 91–92), Google Classroom platform (15, pp. 71–73), and collaborative projects, according to Telecollaboration for Intercultural Language Acquisition Consortium (15, pp. 30–32), were discussed.

4 CONCLUSION AND FUTURE WORK

The topics of research offered to the students gave an opportunity to discover: areas of implementation of new technologies, including robotization of production processes abroad and in Ukraine; modern electronic educational materials for better independent study of individual topics of disciplines in the learning process, to exchange this experience with students of other higher education institutions by making reports at student conferences. In future this topic of students' research may become the theme for writing courseworks and diploma projects under the guidance of teachers of the graduate department in which the students study. The conducted research will make it possible to adapt more easily and quickly to the future work related to the restoration of the destroyed national economy of our country during the war (2014–2023) and in post-war period.

Ukrainian and International students' conferences as well as teachers' conferences are good places for exchanging ideas about usage educational materials of MOOC platforms among students and teachers of different HEIs in Ukraine and abroad.

From the point of view of students, in addition to reports at Ukrainian and international conferences, the research materials of the above mentioned two ways should be distributed using blogs, newsletters, online communities and other means of information dissemination, which can be organized, for example, by students with the help of teachers of the Department of foreign languages and graduation departments together with similar departments of Ukrainian and foreign higher education institutions.

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