

Modern Educational, Scientific and Industrial Process in a Temporarily Relocated Institution of Higher Education: Challenges, Features of Organization, Prospects for Development and Innovations

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Abstract. This research delves into the dynamic landscape of modern educational, scientific, and industrial processes within a temporarily relocated institution of higher education in Ukraine. Faced with unique challenges resulting from external circumstances, this study explores the distinctive features of organizational strategies and the potential for development and innovation in this context. The relocation of an institution of higher education, albeit temporary, poses multifaceted challenges that demand novel approaches. This research investigates the impacts of such transitions on students, faculty, infrastructure, and overall academic operations. By examining the challenges faced by the institution during this period, the study seeks to offer insights into the complexities of maintaining academic continuity and ensuring an enriching educational experience for all stakeholders. In tandem with addressing challenges, the research identifies and analyzes the distinctive features of organizational strategies adopted by the institution during the relocation. The study aims to shed light on how these adaptations influence the overall effectiveness and

resilience of the educational and scientific processes. Moreover, the study assesses the prospects for development and growth in a temporarily relocated institution of higher education. By examining potential opportunities arising from the relocation, such as forging new partnerships, enhancing research collaborations, and leveraging local resources, the research outlines pathways for sustainable development in the face of adversity. This work contributes to a comprehensive understanding of the challenges, features of organization, prospects for development, and innovations in a temporarily relocated institution of higher education in Ukraine. The study also serves as a valuable resource for other institutions navigating similar challenges, offering practical insights into effectively managing temporary relocations while embracing transformative opportunities for progress and development.

Keywords: institution of higher education, relocation, problems, prospects, educational and scientific process, international cooperation.

Introduction. In recent years, the educational process in higher education institutions in Ukraine has undergone significant changes. The changes are related to the need to adapt to the situation that arose as a result of quarantine restrictions proposed by the WHO during the COVID-19 pandemic [1-5] and large-scale hostilities on the territory of the country [6-9]. 616 hospitals were damaged (101 medical institutions were destroyed) [10, 11]. 500 non-working pharmacies were destroyed [12]. Millions of citizens of all age groups, patients, and internally displaced persons were forced to leave their jobs, their homes were destroyed, and they moved to other regions and abroad. In this situation, healthcare institutions and pharmaceutical enterprises remained one of the drivers of the economy in the state. Medical care and medicinal products of all clinical and pharmacological, nomenclature and legal, classification and legal groups are necessary for the pharmacotherapy of health disorders in the system of legal relations "doctor-patient-pharmacist-lawyer" [13-23]. There was a need to adapt health care institutions to the modern educational process in a temporarily relocated institution of higher education [24].

The purpose of the study was to study the peculiarities of the organization, problem solving, development prospects, innovations of the modern educational, scientific, technological, and industrial process in a temporarily relocated institution of higher education.

Materials and methods. The study was carried out between March 2022 and June 2023. Experimental data were processed on the basis of the Luhansk State Medical University. Study Design was based on organizational and legal, clinical, pharmaceutical and pharmacological approaches using literature review.

The research of the article is a fragment of research works of Luhansk State Medical University "Conceptual interdisciplinary approaches to pharmaceutical provision and availability of drugs, taking into account organizational and legal, technological, analytical, pharmacognostic, forensic and pharmaceutical, clinical and pharmacological, pharmacoeconomic, marketing, social and economic competencies" (state registration number 0123U101632, terms 2023-2027).

Results and discussion. The peculiarities of the organization and prospects for the development of medical education were analyzed [25, 26]: raising the level of modern methods of training students, which were traditional for many specialties; improvement of the distance learning format; certain difficulties in conducting educational and laboratory classes, incl. including in health care facilities and pharmacies; insufficient material and technical base; insufficient software, training of scientific and pedagogical workers for new methods and forms of education.

Given the specificity of the field of knowledge 22 "Health care", the transition to a distance format of education affected medical educational institutions [27-29].

Distance learning has become a forced measure [30]:

- in the global educational space acts as an effective complement to traditional forms of education;
- as a means of partial solution of urgent problems;
- to develop modern distance learning technology;
- to promote the activation of the use of new information technologies;
- to rethink the role of the teacher during distance education.

Global trends regarding continuous professional training, internships and advanced training of doctors and pharmacists in the system of legal relations "doctor-patient-pharmacist-lawyer" during the reform of the health care and pharmacy sector caused the optimization of the system of training medical and pharmaceutical personnel; modern technologies in the system of training medical and pharmaceutical personnel; development and implementation of modern information technologies in medical and pharmaceutical education; issues of virtualization of education; psychological problems of doctors and pharmacists at the current stage of health care development; pedagogical and psychological aspects regarding the training of doctors and pharmacists and the preservation of the health of society; psychological training regarding the activities of doctors and pharmacists in crisis situations; ethical and deontological and organizational and legal problems and priorities regarding the development of medical and pharmaceutical education [31].

The expected result of the implementation of the Strategy is the creation of a modern and effective system of higher education that meets the needs of citizens, the economy and society, has a decent reputation and is competitive on the domestic and global markets of educational services. The strategy was approved on April 14, 2022 and published on the website of the Cabinet of Ministers of Ukraine, Order No. 286-r of February 23, 2022 "On the Approval of the Strategy for the Development of Higher Education in Ukraine for 2022-2032" [32]. The tasks and indicators for each operational goal, as well as the expected results, are given in the extended strategic pyramid 80. By the order of the Cabinet of Ministers of Ukraine, the Operational Plan for the implementation in 2022-2024 of the Strategy for the Development of Higher Education in Ukraine for 2022-2032 was approved. Ukraine, together with the International Bank for Reconstruction and Development, which is part of the World Bank group, is implementing the project "Improving higher education in Ukraine for results" during 2021-2026. The implementation of the project is aimed at improving the quality of higher education, ensuring that the skills and knowledge of graduates of higher education institutions meet the expectations of employers, the requirements of the labor market, society, overcoming challenges in

the education sector, ensuring the stability of the education system, and creating conditions for the continuity of the educational process in the conditions of quarantine restrictions and large-scale hostilities.

The activities of the university were legally and practically suspended until March 26, 2022. The functioning of the university in the city of Rubizhne was made impossible due to hostilities and constant shelling. According to the order of the Ministry of Health of Ukraine No. 527 dated 26.03.2022 "On the organization of the activities of the State institution "Luhansk State Medical University" on moving to the city of Rivne and the order of the State institution "Luhansk State Medical University" on the organization of the educational process from 14.03.2022. Teaching staff, students, graduate students, doctoral students, and the administration have started the relocation process to resolve organizational and legal issues. Premises have been found for the accommodation of teachers, employees, and students. We have specific agreements regarding the location of the university's clinical bases. A full-fledged educational process has been organized online. The work of the admissions committee has begun. The work of dean's offices was resumed [33, 34].

The system of internal quality assurance of educational activity and quality of higher education of the State institution "Luhansk State Medical University" is based on the requirements of the Law of Ukraine "On Higher Education", "On Education" and Standards and recommendations for quality assurance in the European area of higher education (ESG 2015). To date, the university has formed an internal normative base of the quality system, which includes the following documents: Mission, vision, values, development strategy for 2020-2025, Code of corporate culture, Regulations on the organization of the educational process, Code of academic integrity, Regulations on academic integrity. The key document regulating quality assurance procedures is the Regulation on the system of internal quality assurance of educational activities and the quality of higher education.

For temporarily relocated institutions of higher education, the biggest challenges in terms of organizing the educational process were the reduction in the number of professors and teachers, scientific and pedagogical workers, graduate students, and doctoral students; lack of educational facilities and laboratories with specialized equipment; loss of connections with health care facilities, pharmacies, pharmaceutical enterprises. Clinical and pharmaceutical departments of the university and stakeholder bases were located on them, providing production practice and employment of specialists - doctors of all specialties and pharmacists (pharmacists).

After moving, there are questions to be solved:

- ✓ restoration of educational and methodical materials in all departments;
- ✓ creation of a modern library fund and a nomenclature of documents of the structural divisions of the university.

The solution to this problem can be significantly accelerated thanks to the website. The website contains documentation of departments and departments in electronic form. Study guides, electronic textbooks, methodical developments, video lectures, tests and written tasks are placed on the corresponding pages of the educational components in the Google Classroom application. The availability of the mentioned materials made it possible to resume the educational process immediately after the relocation in a remote format and prepare the beginning of the new academic year in face-to-face mode. In addition, in the conditions of martial law, electronic resources with tasks make it possible not to interrupt studies in theoretical departments when the applicants are in safe places.

As a result of military aggression, foreign students of higher education were forced to leave the territory of Ukraine, as noted by Shkarlet S. and others [35]. For this contingent, the remote form of education remained the only possible option for the implementation of the educational process. In order to communicate with these students, scientific and pedagogical workers widely use Zoom, Google Meet, Skype, WhatsApp messengers, Facebook Messenger, Viber, Telegram, etc. The use of these applications and Google Classroom enables teachers to conduct lectures, practical classes, and seminars in synchronous and asynchronous modes, to demonstrate the implementation of practical skills, to carry out current and final control of the level of knowledge through testing, surveys, and verification of written tasks.

With the beginning of hostilities, the right of applicants to academic mobility, both within Ukraine and abroad, is in particular demand at the university. Recognition of the results of studies in other institutions of higher education, non-formal and informal education at scientific and practical conferences, master classes, seminars followed by re-enrollment of certain topics or entire educational components enables students to realize their own individual educational trajectories.

One of the most important tasks of the departments is professional practical training of higher education seekers. Agreements on cooperation with the largest specialized health care institutions of the region were concluded to accommodate clinical departments of the university and conduct practical classes. Similarly, by concluding contracts, a significant number of practice bases were created for students of all specialties to undergo industrial practice during the academic year. Before concluding cooperation agreements, special attention was paid to the availability of bomb shelters or shelters in health care facilities to ensure the safety of applicants during the educational process. In a significant number of medical institutions, shelters were arranged for the treatment of the relevant departments, which housed clinical departments. This allows for continuous learning. Some health care institutions have simulation training centers equipped with modern simulators, dummies, and phantoms, where candidates can practice practical skills under the guidance of teachers and instructors of the center.

In order to provide all educational components, scientific and pedagogical workers involved practical doctors in the educational process who had a scientific degree, experience in the relevant specialty, worked in specialized departments, participated in scientific research, and had a desire to engage in pedagogical activities. This is how the problem with the shortage of human resources was solved. On the other hand, the increase of human resources of the departments of fundamental and humanitarian direction was carried out at the expense of inviting teachers from other educational institutions of the region who met the requirements of the Licensing conditions for conducting educational activities.

The main tasks of the development of scientific, technical, and innovative activities are:

- restoration and modernization of the network of research and innovation infrastructure together with foreign partner countries;
- introduction of new tools to support scientists and innovators;
- creation of conditions for preservation of scientific potential, return of forcibly displaced persons to ensure continuation of their scientific, technical, and innovative activities;
- determination of long-term directions for improving the institute of academic mobility in order to strengthen the potential of Ukrainian science;
- introduction of the principles of open science and innovation, which will ensure the competitiveness of Ukrainian science in the single European research space;
- deepening integration into the European and world research spaces, which will ensure the development of Ukrainian science in the long term;
- creation of conditions for long-term development of Ukrainian science and innovative ecosystem; development of applied research and deepening of the relationship between scientific and industrial potential;
- ensuring the commercialization of scientific results and the transfer of technologies, which will contribute to the sustainable economic growth of Ukraine.

The State institution "Luhansk State Medical University" has a scientific and expert commission, which is a permanent body of the scientific department of the university for coordination and expert evaluation of planned scientific research and dissertation works, as well as for expert evaluation and planning of dissertation works. The scientific and expert commission consists of leading scientists, professors, and associate professors – specialists in the medical and biological profile, clinical medicine, pharmacy, and humanitarian profile.

The main tasks and functions of the scientific expert commission are:

- development and coordination of fundamental and the most relevant applied scientific researches at the university, in particular the scientific and research works;

- development, on the instructions of the rectorate, of proposals to optimize the scientific personnel potential of the university;
- an examination of materials for planning dissertation works planned for completion by post-graduate students and university employees, who have the right to perform them outside of post-graduate studies, is carried out;
- development and coordination of complex scientific research with other higher educational institutions and research institutes of Ukraine and foreign countries;
- reviewing and approving monographs for their print edition;
- reviewing at the stage of planning and approving topics of cathedral research works;
- reviewing at the planning stage and approving the topics of doctoral and dissertations for obtaining the academic title of Doctor of Philosophy, as well as bringing the documentation for their planning into compliance with the requirements of the State Certification Commission of Ukraine;
- verification of the primary scientific documentation of dissertations with the creation of temporary commissions by dissertation specialty;
- organization and conduct of public interdepartmental approvals and preliminary defenses of doctoral dissertations and dissertations for obtaining the scientific title of Doctor of Philosophy;
- conducting an examination on the possibility of publishing materials of the scientific and research works in the open press;
- timely correction of forms of current and reporting scientific documentation in accordance with the requirements of the State Certification Commission of Ukraine;
- hearing and approving the reports of the chairman of the bioethics commission, the reports of the chief metrologist of the University regarding the metrological examination of devices and apparatus on which scientific research is carried out at the university, as well as the metrological assurance of publications and dissertations of university employees.

For the competitive selection, higher education institutions and scientific institutions belonging to the sphere of administration of the Ministry of Health submitted 138 topics of scientific research and development, of which: 61 are new and 77 are transitional topics [36]. The Commission on Scientific Research and the National Scientific Medical Library of Ukraine carried out a preliminary evaluation of the materials that were submitted for competitive selection. Based on the results of the meetings, a decision was made regarding the list of those scientific researches and developments that will be financed from the state budget in 2023.

The Order of the Ministry of Health of Ukraine dated December 29, 2022 No. 2376 approved the List of scientific research and development that will be carried out in 2023 at the expense of the state budget" [37]. The list of scientific research and development that will be carried out in 2023 at the expense of the state budget of the "Luhansk State Medical University" given in the Table 1.

Table 1. List of scientific research and development to be carried out in 2023 at the expense of the state budget of Luhansk State Medical University.

No.	Name of scientific research or development	Type of scientific research, period of implementation	Name of scientific research institution, institution of higher education	Rating	Amount of funding, %
1.	Development of new highly economical methods of biomarker diagnostics and forecasting of the course and complications of COVID-19 and community-acquired	Applied, 2023-2025 pp.	Luhansk State Medical University	29	30,0

	pneumonia in military personnel and the civilian population				
2.	Diagnostic algorithm for determining the morphofunctional state of the stomach and duodenum under the conditions of exposure to toxic agents in military personnel and applied in the experiment	Applied, 2023-2025 pp.	Luhansk State Medical University	28	30,0
3.	Development and implementation of innovative technologies for the diagnosis of oncogynecological and oncurological diseases based on the data of liquid biopsy of extracellular DNA and stem cells	Applied, 2023-2025 pp.	Luhansk State Medical University	28	30,0

In order to deepen the cooperation between the Luhansk State Medical University and the State Expert Center of the Ministry of Health of Ukraine, cooperation has been established. Students, graduate students, doctoral students solved practical cases, attended lectures. The search for promising scientific research and development for 2023-2025 is in the scope of holding annual student conferences. In 2023, a student scientific conference was held at the department of anatomy, physiology, and pathophysiology of the university. Students of higher education, 1-5 courses "Medicine", "Dentistry", "Pharmacy" took part in it. Scientific topics of the student scientific society were: development and anomalies of teeth; analysis of statistical material regarding physiological bites and occlusions; teeth bite anomalies; anomalies of jaw development; variant anatomy of the abdominal trunk; physical endurance of future specialists; how the learning environment affects health; microscopic study of white mistletoe; analysis of pectin content in fruit and berry mixture; toxicological characteristics of thallium; zinc – as a vital trace element; the role of iodine and its compounds in human life; The benefits of blueberry (*Vaccinium myrtillus*) in pharmacy; biological role of calcium and its compounds in biosystems, etc. At the general university conference of the student scientific society named after Koveshnikov V.G., the summary of the work of the scientific societies of departments and higher education recipients was announced. Graduates of higher education presented the results of their scientific works in two sections: "Clinical medicine" and "Fundamental medicine and pharmacy". Evaluation of works was carried out according to the following criteria: self-study, disclosure of the topic; coverage, availability of the presentation of the material; content and design of the presentation; mastery of oratory skills.

During the final discussion, Professor Valentyn Shapovalov proposed to the university leadership to initiate the creation of the "Medical and Pharmaceutical "Industrial Park" and "Medical and pharmaceutical cluster "Euro-Rivne 2030", as a component of the system of integration competences of Ukraine to the European Union [38, 39]. The innovative pharmaceutical industrial enterprise will contribute to:

- ❖ creating new jobs for university graduates and improving the quality of life of the region's population;
- ❖ creation of new jobs for other enterprises (up to 5 new jobs are created at other enterprises for 1 employee of a pharmaceutical enterprise);
- ❖ increasing the level of investment attractiveness of the region;

- ❖ the spread of international cooperation at the expense of the "Industrial Park" and the "Medical-Pharmaceutical Cluster";
- ❖ increasing expenditures in budgets of various levels and developing the economy of the region and Ukraine;
- ❖ construction of an enterprise and housing for specialists;
- ❖ infrastructure development, introduction of innovative and energy-saving technologies;
- ❖ development and implementation of new drugs in industrial production and medical practice [40-44].

An objective structured clinical (practical) exam was held at the State institution "Luhansk State Medical University". This is a modern type of assessment of knowledge in medicine and pharmacy. Learners are given the opportunity to demonstrate their skills and knowledge in a variety of clinical situations:

- students were offered various tasks; their actions were observed and an objective assessment of knowledge was given;
- in turn, the students of education demonstrated the ability to independently examine the patient, make a diagnosis, perform medical manipulations, and provide qualified assistance;
- at the exam there were four rooms where eight different stations were placed;
- such an exam allows future doctors to gain valuable practical experience and test their knowledge in real situations.

Within the walls of one of the most famous educational institutions in Europe, the rector of Luhansk State Medical University, met with the rector of the John Paul II Catholic University, professor Myroslav Kalinovsky. After a short excursion into the long history of the institution, an agreement was signed between the universities. The agreement aims to promote international cooperation in the fields of education, science, innovation, and culture, as well as to deepen international mutual understanding and commonwealth between the two parties. Among the spheres of international cooperation:

- joint learning, scientific activities, innovative technologies, and cultural activities;
- international scientific and educational exchanges for professors and teaching staff, scientists, and students of both universities;
- organization of joint scientific and practical conferences, seminars, and round tables.

International cooperation is a great opportunity for the university to expand its outlook, exchange knowledge, and introduce new ideas. The partnership will bring great gains and joint achievements in education and science to students, teaching staff, graduate students, and doctoral students [45-47].

Important for the development of international relations and cooperation of the Luhansk State Medical University is a meeting with the vice-rector of the Warmian-Masurian University in Olsztyn, Jerzy Jaroszewski, to discuss the possibilities of cooperation between the universities, namely:

- ✓ cooperation between the Luhansk State Medical University and the Warmian-Masurian University, which will be an important step in developing international prestige and improving the quality of education for students;
- ✓ the negotiations covered various areas of cooperation, such as the exchange of students and teachers, joint scientific research and projects, the organization of joint conferences and seminars, as well as the exchange of cultural programs;
- ✓ development, implementation and exchange of knowledge and advanced methods in their fields.

Students (future doctors and pharmacists) of the Luhansk State Medical University have taken an important step in their life and professional training. They took a military oath of loyalty to the Ukrainian people. This is a significant moment that symbolizes the readiness of young people to take responsibility for the protection and service of the Motherland. The importance of the formation of responsible civic consciousness, patriotism, service, and loyalty to the principles on which our state is based was emphasized. Taking the military oath is a symbol of unity and dedication of university students to their nation and state. This important step will help them not only in their personal

development, but also in their future professional activities, where they will be able to make a significant contribution to ensuring the medical well-being and security of our country.

Conclusions. Peculiarities of the organization, problem solving, development prospects, and innovations of the modern educational, scientific, technological, and industrial process in the temporarily relocated institution of higher education were studied. It has been proven that in the conditions of modern challenges, there have been mass movements of citizens of all age groups, patients, to other regions and abroad. The destruction affected institutions of higher education as a result of the military conflict. The risks of adapting higher education institutions to the modern educational process due to forced relocation are increasing. Forms and means of distance education are given. The problems of providing all educational components by scientific and pedagogical workers to the educational process have been studied. The scientific research of teachers and students at the new place of educational activity was analyzed. Areas of international cooperation are indicated. The creation of components of the system of integration competences of Ukraine to the European Union is proposed.

Conflict of interests. The authors confirm that they are the authors of this work and have approved it for publication. The authors also certify that the obtained data and research were conducted in compliance with the requirements of moral and ethical principles based on medical and pharmaceutical law, and in the absence of any commercial or financial relationships that could be interpreted as a conflict or potential conflict of interest.

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