

Digital Component of Professional Competence of Masters of Pharmacy in the Framework of Blended Learning

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Abstract

This article is devoted to theoretical and practical issues in the field of studying the impact of distance learning technologies on the professional training of students of the Faculty of Pharmacy. We analyzed the "National Strategy 2015-2020" and its key principles concerning all healthcare specialists, and particularly, the pharmaceutical branch. In the context of distance learning, and informative component plays a significant role in the training of specialists and the formation of professional competence of masters of pharmacy. We investigated the directions of using modern information and communication technologies and their role in the development of the pharmaceutical industry. We considered the set of pedagogical conditions that ensure the effectiveness of the implementation of distance learning in the process of studying pharmaceutical disciplines since the improvement and maintaining of professionalism is one of the main tasks of the teaching staff and students of medical (pharmaceutical) (M (Ph) HEI) of higher educational institutions. The dynamics of changes in student's rate achievement for the 2018-2020 academic year are analyzed.

Keywords: Professional competence, information component, information technology, distance learning, students-pharmacists

INTRODUCTION

The current level of development of information technologies significantly affects all spheres of life and is used in the professional activity of a person. The educational industry is also no exception - the use of information technology takes a leading position in the creation and improvement of the components of the educational process, the formation of general and special (professional) competencies.

Statement of the problem and justification of relevance

Characteristics of the modern employment market are flexibility, variability, and high innovative dynamics. As a result, there are new demands for future specialists such as willingness to constant self-education, improvement of professional qualification, business communication, actions in non-standard and undefined situations; readiness to make responsible decisions, ability to a critical conversation, self-management of behavior and activities; ability to work with various sources of information; effective behavioral in a competitive environment, under stress factors. The violation of parity that is observed between the requirements of employers and the quality of training M(Ph) HEI graduates significantly complicates the adaptation of young specialists in modern social and economic conditions.

MATERIALS AND METHODS

As a result of the analysis of examinations, systematic methods were used. Results of handing over of examinations are KROK 1 "Pharmacy" and "Technologies of perfumery and cosmetic products" by the students of pharmaceutical specialties.

RESULTS AND DISCUSSION

The competency-based approach in education has been studied in the works of N. Bibik, V. Bolotov, N. Gholub, I. Ermakov, I. Zimnyaya, A. Lebedev, A. Lokshina, M. Lukyanova, A. Ovcharuk, S. Sysoeva, R. Steples, Yu. Tatura, A. Khutorsky, and others.

Issues related to the features of the formation of information competence have been considered in the studies

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of V. Bykov, N. Zhaldak, N. Morse, A. Popov, A. Ryzhov, Yu. Ramsky, N. Stuchinska, A. Spirin, and others. Scientific achievements of O. Golovchenko, L. Konovalova, I. Nizhenkovska, T. Reva, A. Chkhalo dedicated to the problems of competence-based approach in pharmaceutical education [1-8]. The process of training a modern specialist is determined by the strategic directions of the development of world education [9-12]. The works of I. Kucherenko, P. Mikitenko are devoted to practical scientific and methodological support of informative training of students, including future pharmacists.

The works of I. Bulakh, M. Mruga, L. Voitenko, L. Glushko, Yu. Voronenko, A. Yavorovsky, A. Volosovets are devoted to the preparation for licensed integrated exams (LIE).

The purpose of the study

To investigate the role of the informative component in the formation of professional competence of future masters of pharmacy in a blended learning environment

Presentation of the main research material. Recently, there has been a tendency when students cannot always apply the acquired knowledge in their further professional activities. The pharmaceutical industry specialists have an insufficient level of skills and abilities, which is associated with the rapid development of information technology [13-15].

The starting points for justifying the feasibility of using information technology (IT) in teaching students of pharmaceutical specialties M (Ph) HEI are strategic directions for improving information technology, which is presented in the "National Strategy 2015-2020" [16]. It indicates that information is an important part of improving management in the health care system of Ukraine. The following principles are identified as strategically important:

- The use of IT as a tool to improve the quality of medical and pharmaceutical data processing, as well as the exchange, use, and dissemination of knowledge and information, transparency, accountability, and economic efficiency of the providing of educational services [17, 18];
- Introduction of new IT services at the level of the Ministry of Health of Ukraine, which will significantly strengthen the capacity of the central executive authority in the field of planning, implementation, and monitoring of health programs;
- Computerization of health care institutions, operating as autonomous units, with the establishment of an information environment at the level of service providers (facilitating computerization and connection to the global internet is one of the main requirements, starting from the level of primary health care);
- Organization of IT education for health workers and setting standards in the field of health informatization [19].

These strategic priorities apply to all healthcare professionals, and particularly, the pharmaceutical industry [20-22]. Starting from 2016-2017 academic year at the Pharmacy Faculty of the National Medical University named after O.O. Bogomolets training of future specialists in the field of knowledge, 22 health care specialty 226 "Pharmacy" was carried out according to educational programs of "Pharmacy" and "Technologies of perfumery and cosmetic products". From 2017-2018, the educational specialty 226 "Pharmacy" was replaced by the specialty 226 "Pharmacy, industrial pharmacy".

In the "National Strategy 2015-2020" considerable attention has been paid to the use of information technology in the process of pharmaceutical reform, namely during the organization and implementation of electronic tenders. The introduction of new e-health services (eHealth, ePrescription, eConsultation, preventive monitoring, and management of chronic patients) is also promising, which will improve the availability and quality of health services for citizens, support an efficient service process for service providers and improve resource allocation.

The use of IT in the activities of pharmaceutical enterprises requires the implementation of new forms and means into the training process of students-pharmacists, contributing to the increasing activity and the development of operational thinking in the performance of functional duties, namely: the ability to independently search, analyze and synthesize information from various sources and these results utilize to solve typical and complex specialized tasks of professional activity; carry out professional activities using navigation systems, Internet resources, software, and etc; generalize, systematize and use the information component in professional activities; carry out statistical processing of the results following the applicable regulatory and legislative acts.

In the training process of the students of pharmaceutical specialties M (Ph) HIE, it is necessary to take into account that in recent years the pharmaceutical industry has been actively used such information technologies as:

- data management (DM)
- electronic data interchange (EDI)
- graphic bar (Barcoding - BC) and matrix (quick response - QR) coding;
- artificial intelligence/expert systems (Artificial intelligence/expert systems – AI/ES)
- remote access and communication (RA & C).

Implementation and the use of information retrieval systems, databases, communication services, electronic data exchange systems, bar quotation, allow you to manage data that is available to all partners of the trade cycle in the pharmaceutical industry.

Improving the quality of teaching, intensifying the educational process, and using new teaching technologies is still impossible without the implementation of various types of automated systems into the educational process. Teaching academic disciplines using distance learning technologies significantly differs from traditional learning technologies. This is mainly based on the student's independent mastery of the educational material. However, in the context of a pandemic, because of the spread of the COVID-19 virus, the use of distance learning technologies is a forced step, and the specialties for which such studying way was considered impossible and unacceptable, or served only as an additional tool, are now operating with these technologies like other ones.

The effectiveness of the implementation of distance learning in the process of studying pharmaceutical disciplines is provided by a set of pedagogical conditions:

- the formation of students' positive motivation for independent work in the process of studying pharmaceutical disciplines;
- ensuring the readiness of teachers to use distance learning technology;

- timely operational filling of the information educational environment with educational content.

Also, it is important to state that persistent and consistent application of distance learning tools and methods allows :

- to provide unhindered access for students to sources of modern information, including rare and expensive, not available in the libraries of the M (Ph) HIE;
- to provide students with the opportunity for self-control and optimization of the learned educational material in the process of home preparation for seminars (by accessing interactive lectures and educational tests)
- to ensure objectivity in assessing the level of students' training.

To ensure the effectiveness and improve the quality of training, the staff of the Pharmacy Faculty posted educational and methodological materials, video lectures, video-practical works, and materials for preparation for LIE KROK on the distance learning platform of the University and the YouTube channel of distance education of the national medical university named after O.O. Bogomolets (**Figure 1**).

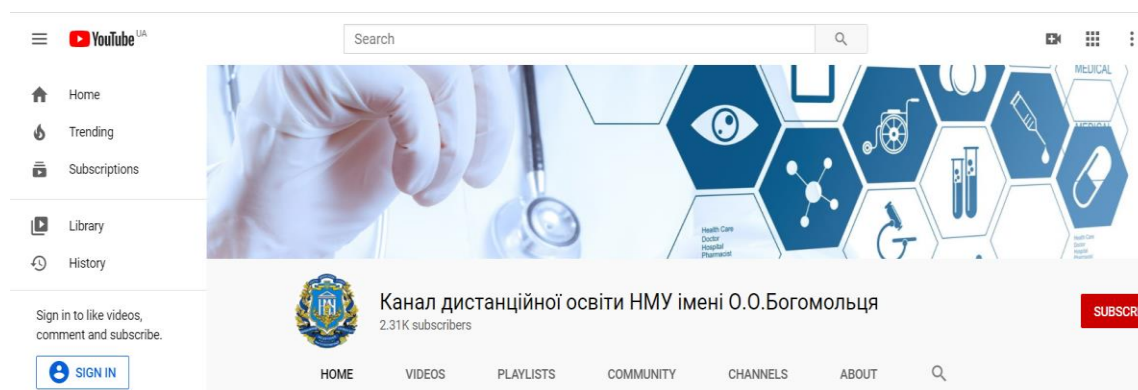


Figure 1. The main page of the university YouTube channel

During distance learning, the teachers of the University pay special attention to the preparation for LIE KROK in the studying process for future masters of pharmacy.

To prepare students of the Pharmacy Faculty for the KROK exam on the distance learning platform of the NMU named after O.O. Bogomolets, there are several modes, namely:

- self-study mode (students are shown the correct answer when they do a test, hyperlinks are inserted to the definition and certain topics for the courses hosted on the platform, the testing time is not limited, and several testing attempts are possible)
- control mode (the correct answer is shown at the end of testing, time limit, only one attempt is possible).

Following the "Regulations on the system of licensing examinations" after approval by the order of the Ministry of Health dated 08.14.1998 No. 251 licensed integrated exams KROK were introduced in all educational institutions of Ukraine, which provide training in the direction of

"Medicine" and "Pharmacology". External testing is carried out to establish the compliance of the State standards of higher education with the level of competence of future masters of pharmacy. "KROK" allows determining the quality of students' training so the work teachers' work and the organization of the educational process in various medical (pharmaceutical) educational institutions. Since 2018, preparation for licensed exams of students of the Pharmacy Faculty has been carried out on the distance learning platform of the National Medical University named after O.O. Bogomolets. It should be emphasized that the average value of student's rate achievement in passing KROK 2 "Pharmacology" at the faculty in 2019 reached almost 82.18%, while the national indicator was 82.8%. In 2020, the rate of the university is already significantly rose and amounted to 86.6%, while the national indicator was only 82.4%. Data on the dynamics of significant growth of student's achievement in all disciplines that are included to LIE "KROK 2. Pharmacy" and got during distance learning using information technology, is shown in **Figure 2**.

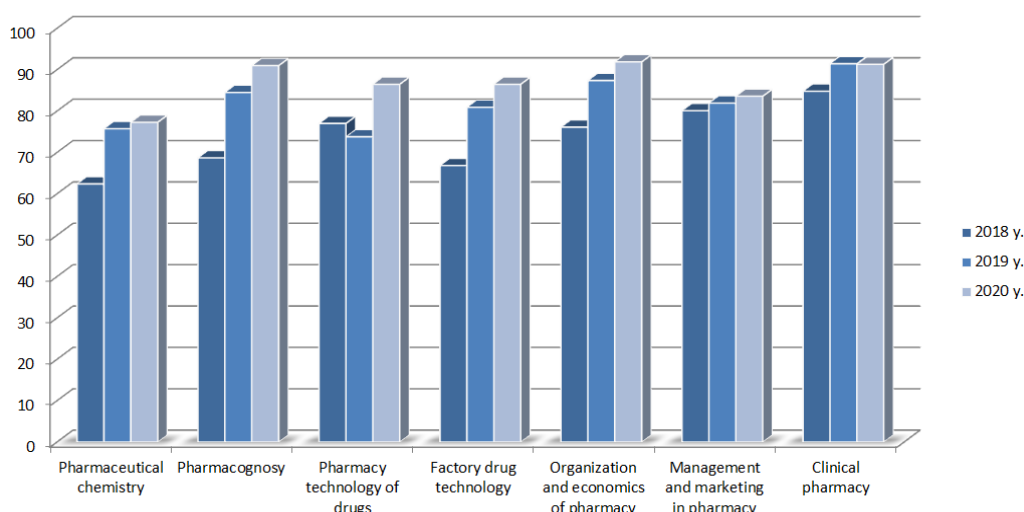


Figure 2. Results of passing LIE KROK 2 PHARMACY, depending on the content of the exam for the last 3 years.

In the 2019 academic year, the national student's rate achievement following KROK 2 "Technology of perfumery and cosmetics" was 84.6%, at the faculty - 81.8%. In the

2020 academic year, this rate is 85.9% in Ukraine, and at the faculty - 85.5%. (**Figure 3**).

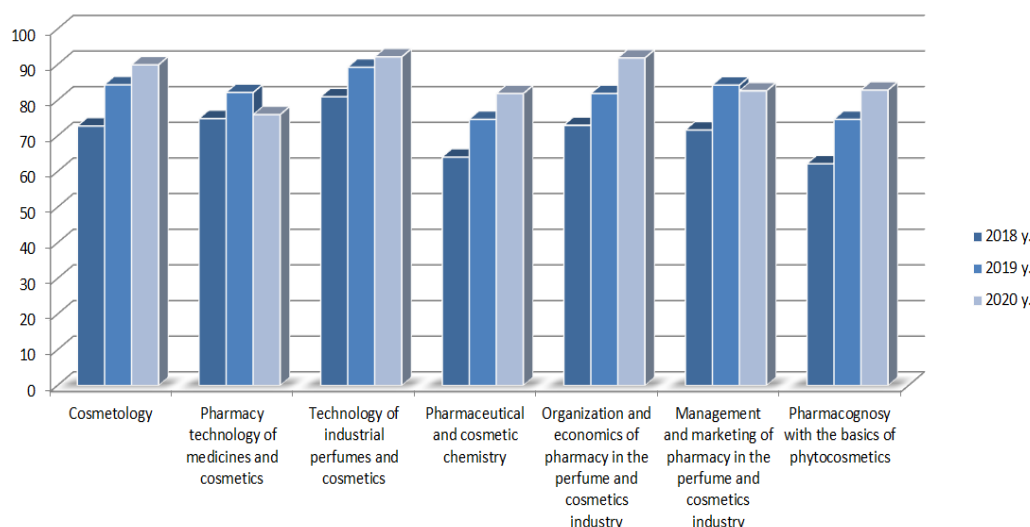


Figure 3. Passing results LIE KROK 2 TPCM depending on the content of the exam for the last 3 years

CONCLUSION

During the period of mastering training courses and preparation for licensed integrated exams on the distance learning platform of the National Medical University named after O.O. Bogomolets students of the Pharmacy Faculty not only increase their skills in using gadgets and IT but also significantly improve the digital component of professional competence. It is confirmed by an independent assessment of the preparation of licensed integrated exams.

We found that quality content and the convenience of online testing play a significant role in mastering disciplines and preparing for exams.

Promising, in our opinion, is the continuation of filling the courses with the content on the distance platform, and the YouTube channel of the University.

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ETHICS STATEMENT: All measures accomplished in this scientific trial containing human supporters remained in similarity through the ethical principles of the institutional advisory group.

REFERENCES

- Channel of distance learning in National Medical University named after O.O. Bogomolets. Access mode: https://www.youtube.com/channel/UCVZ4VXjeZ-1pb1Ca47v83GQ?view_as=subscriber
- Distance learning platform of the National Medical University named after O.O. Bogomolets Access mode: <http://neuron.nmuofficial.com/>
- Gayova L.V, Yanitska L.V, Obernikhina N.V, Sanzhur T.S. Licensed integrated exam "KROK 1. Dentistry" at the National Medical University named after O.O. Bogomolets as an indicator of quality control of education: interdisciplinary integration. Monitoring aspect. 2017;7(15):15-8. Access mode: http://journals.uran.ua/sr_edu/article/view/107335/103046
- Ibrahim S, Azhar AS, Ather AS, Ahsan AS, Muneer AS, Kaleem AS. Backache: Association with Stature, Posture and Work-Station Ergonomics in Information Technology Professionals-An Analytical Study. *Int. J. Pharm. Res. Allied Sci.* 2019;8(2):10-4.
- Inna Kucherenko Psychological and pedagogical features of studying computer science disciplines in medical institutions of higher education with the use of distance learning. 2019;1(85):28-39. Access mode: https://repository.sspu.edu.ua/bitstream/123456789/7307/1/Kucherenko_Psykholoho-pedahohichni.pdf
- Mykytenko P.V, Lapinskij V.V. Designing interdisciplinary integration of medical informatics. *Information technologies and Learning tools.* 2020;1(75):26-41. Access mode: <https://doi.org/10.33407/itlt.v75i1.3569>
- National strategy for health care reform for the period 2015-2020 Access mode: <http://moz.gov.ua/uploads/0/691-strategiya.pdf>
- Nizhenkovska I.V, Reva T.D, Chkhalo O.M, Holovchenko O.I. Technology-Driven Self-Directed Learning of Graduate Pharmaceutists: Adding Value through Entrepreneurship. *Int. J. Learn. Teach. and Educ. Res.* 2020;19(6):111-26. Access mode: <https://doi.org/10.26803/ijlter.19.6.7>
- Panfilova H, Hala L, Simonian L, Tsurikova O, Gerush O, Bogdan N. The study of problems and prospects of the pharmacy network development in Ukraine in the context of changing approaches to the state regulation in the retail segment of the national pharmaceutical market. *J. Adv. Pharm. Educ. Res.* 2019;9(3):128-35.
- Pellio I.M, Reva T.D., Nizhenkovskaya I.V., Kozak N.D., Konovalova L.V. Trends in professional training of pharmacy specialists in Ukraine. *Med. Perspect.* 2020;25(3):4-8 Access mode: <http://journals.uran.ua/index.php/2307-0404/article/view/214543>
- Reva T.D. Competence approach in teaching chemistry of future pharmacists: theoretical and methodological principles. «Edelweiss» Publishing Company. Kyiv; 2017.
- Reva T.D, Nizhenkovska I.V, Stuchynska N.V, Chkhalo O.M. Status, and prospects of development of national higher pharmaceutical education Medical perspectives. 2020. T. 25(2):19. Access mode: <https://doi.org/10.26641/2307-0404.2020.2.206336>
- Sergeevna SM, Efimovna LE. Improving training of pharmaceutical specialists for consultation in pharmacy organizations using interactive forms of education. *Pharmacophore.* 2020;11(2):7-14.
- Strategies for the development of the information society in Ukraine for 2013-2020. Access mode: <https://zakon.rada.gov.ua/laws/show/386-2013-%D1%80#n8>
- Stuchynska N.V, Tkachenko Yu.P. Didactic principles formation of professional competencies of students at higher medical educational institutions by means of information and educational environment in the process of studying physical and mathematical disciplines. *Collection of scientific works of Kamyanets-Podilsky National University named after Ivan Ogienko. The series is pedagogical.* 2010;1(16):60-2. Access mode: <http://journals.uran.ua/index.php/2307-4507/article/view/32635/29236>
- Tleuzhanova GK, Sarzhanova GB, Joldanova DK, Eskzinova ZA, Assanova DN. The role of it technologies in the formation of student leadership. *J. Adv. Pharm. Educ. Res.* 2019;9(2):89-94.
- Volodymyr Sadivnychi, Olena Bondarenko, Iryna Zhylenko, Nataliia Prokopenko, Vladyslav Nizhehorodtsev, Inna Kucherenko The development of interactive teaching methods for students using computer technology. *Int. J. Manag.* 2020;11(6):1002-11. Access mode: http://www.iaeme.com/MasterAdmin/uploadfolder/IJM_11_06_088/IJM_11_06_088.pdf
- Zhdan V. M, Bobyrev VM, Bilash S.M, Belyaeva O.M. Modern educational environment of higher medical educational institution as a factor of its competitiveness. *Med. Educ.* 2017;3: 40-5. Access mode: <https://core.ac.uk/download/pdf/276622335.pdf>
- Fauziah F, Surachman E, Muhtadi A. Integration of service quality and quality function deployment as an effort of pharmaceutical service improvement on outpatient in a referral Hospital Karawang Indonesia. *J. Adv. Pharm. Edu. Res.* 2019;9(2):13-23.
- Kotvitska AA, Kubarieva IV, Lekhmak IB, Karpenko LA, Havrysh NB, Zhirova IV. The international experience study of organization of medical and pharmaceutical care to the population in emergency situations. *J. Adv. Pharm. Edu. Res.* 2019;9(3):7-12.
- Tulasi SL, Swamy AV, Peddi P, Ganji RR. Development and Validation of Analytical Method for Determination of Eesomeprazole in Pharmaceutical Effluents Using Reverse Phase High-Performance Liquid Chromatography. *Int. J. Pharm. Phytopharmacol. Res.* 2019;9:71-80.
- Patel PK, Janghel V, Chandel SS, Sahu J. Madhuca indica (Mahua)-Pharmaceutical, Nutraceutical and Economical Importance for Tribal People of Chhattisgarh State. *Int.J. Pharm. Phytopharm. Res.* 2019;9(3):16-28.