The Communicative Competence of Future Healthcare Specialists in the Context of Pharmaceutical Market Transformation

Sophia Blahun[1]*, Natalia Stuchynska[2], Nina Lytvynenko[1], Iryna Khmil[3], Tamara Serhiienko[1], Vitaliy Hladyshev[1]

[1]Department of Language Education, National Medical University named after O.O. Bohomolets, Kyiv, Ukraine. [2]Department of Medical and Biological Physics and Computer Science, National Medical University named after O.O. Bohomolets, Kyiv, Ukraine. [3]Department of Forensic Medicine and Medical Law, National Medical University named after O.O. Bohomolets, Kyiv, Ukraine.

Abstract

Pharmaceutical market transformation sets high demands on the level of the management of educational process and the formation of professional competence of the future healthcare specialists particularly. The article aims at evaluating the effectiveness of modern technologies in the management of the formation of communicative competence of future healthcare specialists in the context of pharmaceutical market transformation. Modern technologies and web tools for organizing educational processes are analyzed at every stage of the practical class. The authors define the concept of "communicative competence" and distinguish its components: motivational, cognitive, and activity components. Changes in the levels of the components of communicative competence of the 295 students of the National Medical University named after O.O. Bohomolets, who are studying at the pharmaceutical department, before and after the experiment have been analyzed. Statistical analysis of data collected before and after the experiment of each component of communicative competence has shown significant differences between levels (excellent, very good, good, and satisfactory) in the control group and experimental group, which is the basis for the statistical significance of these differences when applying the modern technologies and web tools into the educational process, which can prove the effective management of the formation of communicative competence.

Keywords: Pharmaceutical market transformation, Communicative competence, Modern technologies, Web tools

Introduction

The World Health Organization emphasizes the statement "there is no health without a workforce" [1]. People must have equitable access to a well-educated, trained, and distributed health workforce to achieve universal health coverage. The pharmaceutical care needs of a patient can be carried out on the condition that an adaptable and flexible pharmaceutical workforce is deployed accordingly to use its knowledge, skills, and abilities to the maximum as part of the multidisciplinary team [2].

The current transformation of the pharmaceutical market sets high demands on the level of training and management of the formation of professional competencies of the future healthcare specialists. WHO and International Pharmaceutical Federation distinguish the following competency framework of the future pharmacists: "1. Prepare, obtain, store, secure, distribute, administer, dispense and dispose of medical products; 2. Provide effective medication therapy management; 3. Maintain and improve professional performance; 4. Contribute to improving the effectiveness of the healthcare system and public health" [3]. Modern pharmacy practice mission is defined by WHO and the International Pharmaceutical Federation as "contributing to health improvement and helping patients with health

problems to make the best use of their medicines", which consists of the following components: "being readily available to patients with or without an appointment; identifying and managing or triaging health-related problems; health promotion; assuring the effectiveness of medicines; preventing harm from medicines, and making responsible use of limited health care resources" [3].

Pharmaceutical market transformation changes the role of the pharmacist from "product-focused" to "caregiver", which is committed to person-centered care by ensuring the high-quality use of medicines [4]. Moreover, there are generic

Address for correspondence: Sophia Blahun, Department of Language Education, National Medical University named after O.O. Bohomolets, Kyiv, Ukraine. blahun@ukr.net

roles such as an educator, manager or mentor, service developer, and researcher, which are expected from the pharmacist [4].

The modernization and transformation of education require the solution of such current issues as human and fundamental values orientation, the democratization of education, and the improvement of pedagogical technologies directed on individualization, academic mobility, and distance of the educational process, which will result in preparation of qualified future specialists. The formation of personality occurs in the educational process when the following conditions are pursued: the creation of a positive mood for learning, which contributes to "equal among equals" feeling, providing a positive atmosphere in the academic group to achieve common goals; the ability to express opinions and discuss them with colleagues, the teacher is not a means of "praise and punishment", but – a mentor or a senior friend; all of that can be provided with the modern learning technologies.

Traditional education has been changed greatly because of the pandemic of Covid-19. To maintain the educational process at a high level and not to worsen the academic students' performance, new technologies for organizing practical classes are investigated and involved in the educational process. The use of information and communication technologies facilitates the formation of communicative competence and gives various opportunities for organizing and supporting the educational process on the qualified level. They can be used for checking the initial level of knowledge and skills of students, for presenting educational information, for practical training and interaction, and for controlling and evaluating students' academic achievements.

Fluency in terminology for future doctors and masters of pharmacy is the key to successful professional activity, so we single out terminological competence as a component of professional communicative competence. We consider the concept of "communicative competence" as the ability of a specialist to meet the requirements of the profession, to demonstrate appropriate personal qualities in situations of professional communication, to use knowledge of professional terminology, skills, and abilities to use accurately and linguistically correct terms in oral and written professional speech and to be aware of the need for self-development and self-improvement.

Many researchers investigated the issue of the use of information and communication technologies, for example, the works of Sivo, S.A., Ku, C-H. and Acharya, P. [5] dwelt on technology acceptance in online learning courses; Weidlich, J., and Bastiaens [6] stressed upon the need to consider the aspect of technological mediation in online distance learning; T.J. Puspitasari, K.A., and Oetoyo, B. [7] studied the effect of open and distance learning system on

students' academic success; Tkachuk V., Yechkalo Y., Semerikov S., Kislova M. and Hladyr Y [8] comprehensively studied ICT in education and research; Melnyk N., Kovtun O., Postolenko I. and Tovkach I. [9] pointed out the peculiarities of educational process in the conditions of COVID-19 in Ukrainian universities. The assessment of student achievement with the help of modern technologies was studied by Brown, G.T.L. [10] Sergienko V.P., Franchuk V.M., Kuhar L.O., Galitskiy O.V., and Mikitenko P.V. [11]. The necessity of the engagement of modern technologies into the educational process in learning pharmaceutical terminology, botanical and chemical nomenclatures by future masters of pharmacy has been comprehensively studied by Blahun S. S. and Stuchynska N. V. [12], in radiological diagnostics training – by Stuchynska N.V., Belous I. V. and Mykytenko P.V. [13], in learning English for professional purposes at medical universities – by Demydovych O. and Holik O. [14] and in language education – by Lytvynenko N. P. and Misnyk N. V. [15]. Some researchers as Bondarchuk O. I., Balakhtar hV. V., Balakhtar K. S., Kyrichuk V. S., Yakubovska N.O., Ostapov S. E., and Grubi T. V. [16] focused their attention on the investigation of the effectiveness of using ICT tools for monitoring the psychological component of the quality of teacher's activity of the higher education institutions.

The present research aims to study the effectiveness of modern technologies in the management of the formation of communicative competence of future healthcare specialists in the context of pharmaceutical market transformation. As the Latin language is the main source of terminology, which future healthcare specialists use in their professional communication, we investigate the use of modern technologies during practical classes in Latin at medical university.

About the aim of the present research, the following tasks were formulated:
- to classify and describe the use of modern technologies and web tools for practical class;
- to assess the effectiveness of the use of modern technologies in the management of the formation of communicative competence of the future healthcare specialists in the context of pharmaceutical market transformation by estimating changes in the levels of the components of communicative competence of the participants before and after the experiment.

Today, the Electronic clinical pharmacologist system is undergoing pilot clinical testing in several regions of the Russian Federation (Stavropol territory, Irkutsk region, Moscow, Moscow region, Rostov region).

introduction of the discipline "Pharmaceutical consultation" using interactive methods of education allowed to improve the quality of preparation of specialists for future work with patients in pharmacy organizations, as well as to justify the

expediency of a practical approach to the educational process in the specialty "Pharmacy".

The classification of the modern technologies and web tools for practical class, which should manage the formation of communicative competence of the future healthcare specialists in the context of pharmaceutical market transformation.

The practical class in Latin has a different structure than a lecture that's why those peculiarities must be considered. The practical training inactive form consists of different stages: preparatory stage, main stage, and final stage. We divide modern technologies into practical classes, according to the didactic purpose of those stages:

1. Technologies for the Preparatory Stage of the Practical Class.

They are used for checking the initial level of knowledge and skills of students; and presenting information (the topic and the purpose of the practical class, basic literature for preparation). At this stage, we use the combination of e-learning and mobile learning. At LIKAR_NMU platform the theoretical materials of the topic and short presentation to it are added. Students have the access to them at any time and can download a folder with documents in .pptx or .doc formats easily.

Groups created at Viber, Telegram and WhatsApp can be the fast way of communication with students, giving advice and recommendation. Mobile application Kahoot! is a student-response tool for all platforms, allowing teachers to run game-like quizzes and build presentations with embedded quizzes **(Figure 1)**. Teachers can create interactive tasks with the help of Kahoot! studying platform and check the initial level of knowledge in a short period.
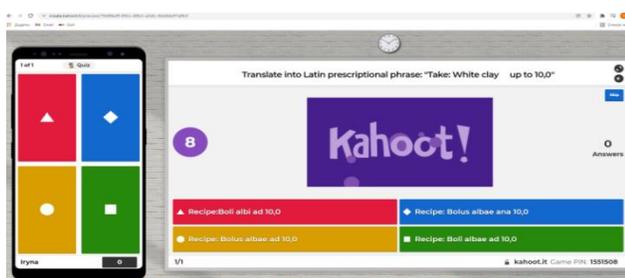
Figure 1. Interactive task created at Kahoot! studying platform for checking the initial level of knowledge

2. Technologies for the Main Stage of the Practical Class

They are used for transferring educational information (the structural and logical scheme of the content of the topic), practical training, and interaction. Web-conferencing with the help of Zoom application provides the following opportunities:

- the demonstration of an interactive whiteboard, screen, presentations, and comments;
- the possibility of using video and audio materials;
- to view all users at once, or separately, all users can see who is speaking;
- the option "raise your hand" helps a teacher to notice, who is the first student willing to answer, the general number of students with the raised hand can be seen;
- prolongation of the "interactive conference" after reconnection;
- the access from a computer, tablet, or phone;
- a real-time chat for giving questions and writing answers;
- adding visual emotion, which allows to track the reflection of users;
- to record the "interactive conference" from the beginning to the end and save it.

Microsoft Teams brings users together in a collaborative work or learning environment and provides effective interactive learning. The opportunities of "interactive conference" in "Microsoft Teams" are the following:
- a real-time screen demonstration or presentation;
- writing messages in personalized chat;
- the availability of a digital board;
- to "raise your hand", which allows to speak, but without interfering with other participants;
- the work with files;
- presentation, discussion, and training can be performed.

Web-conferencing is also possible with the help of Skype, Viber, and Google Meet. At this stage of the practical class, we offer to use those services: EdPuzzle, Blendspace, VideoNotes, Teacher, eduCanon, Snowbie, Popplet, Prezi, Glogster, and Bookwidgets.

3. Technologies for the Final Stage of the Class

They are aimed at summing up the lesson, controlling and evaluating students' academic achievements.

The LIKAR_NMU platform gives a wide range of possible question types which can be used for evaluating students' academic performance: "True/False", "Essay", "Multiple choice", "Matching", "Drag and drop into text", "Drag and drop markers", "Drag and drop onto image", "Calculated", "Calculated multi-choice", "Calculated simple", "Numerical", "Random short-answer matching" and others. "True/False"

There are only two choices ("True" or "False") for an answer in this question type. Exempli gratia:
- Students are given the statement, which they are to choose "True" or "False": "The Gen. sg. case is used in pharmaceutical terms with non-agreed modifier". Answer: True.

An image can be added to the content in this kind of question. Exempli gratia:

- Students are given the Latin name of a plant and the picture of it with English equivalent is attached: "Is the Latin name of the following plant "Leonurus, i m"?". Answer: False **(Figure 2)**.
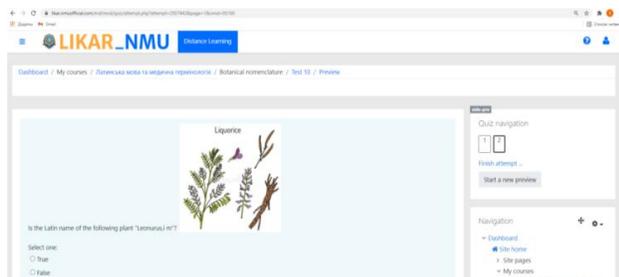
Figure 2. The example of "True/False" question type at LIKAR_NMU platform

"Essay"

There is an option of answering by entering text online or uploading files. This type of question is to be marked manually and students will get their grade only after checking by a teacher. Exempli gratia:

- Students are given a question that can be answered by a few sentences:

"What is the role of Latin in international terminology?" Answer: 10-15 sentences about the origin of terminology, the use of Latin and Greek borrowings in modern European languages, and the examples of medical terms.

"Multiple choice"

There are "Single-answer questions" and "Multiple-answer questions" in this question type. It gives a lot of flexibility for evaluating students' answers. Exempli gratia:

- Students are given a question, where more than one answer is allowed: "What is the meaning of the Latin suffix –oma?". Answers: a. tumor and d. increasing in volume.

If students give only one correct answer, they can get 50 % of the total grade for this question. Otherwise, the settings can be chanced and in that case, students' grades will be 0.

"Matching"

There is a question and a list of statements that must be matched against another list of statements. If students make incorrect matching, they can get a grade but not maximum for the total question. Exempli gratia:

- Students are given a task to find the equivalent: on the left side Latin prefixes are listed and on the right side Greek equivalents must be chosen. Answers: "semi-" – "hemi-"; "contra-" – "anti-"; "con-" – "syn-"; "post-" – "meta". **(Figure 3)**.
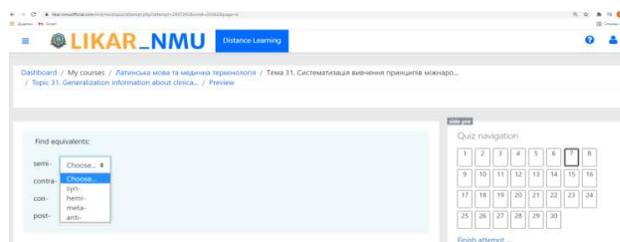
Figure 3. The example of "Matching"question type at LIKAR_NMU platform

MATERIALS AND METHODS

Materials

The combination of research methods (the qualitative and the quantitative methods) has been used in our study in the same ratio. The qualitative research has been carried out in record keeping, qualitative observation, and one-to-one discussion to consider the participants' academic achievements in a biased way. The quantitative method has been conducted by gathering quantifiable data and performing statistical analysis in an unbiased way.

Participants

295 students of the National Medical University named after O.O. Bohomolets, who are studying at pharmaceutical department, have been enrolled in the study.

Procedure

The research from 2017 to 2020 has been conducted to assess the effectiveness of the use of modern technologies in the management of the formation of communicative competence of the future healthcare specialists in the context of pharmaceutical market transformation by estimating changes in the levels of the components of communicative competence of the participants before and after the experiment. At the first stage (before the experiment) students were divided into a control group (CG, 111 students) and an experimental group (EG, 184 students). At the second stage (after the experiment) the statistical analysis of the collected data has been carried out. We distinguish the following components of communicative competence: motivational, cognitive, and activity components. To check the formation of motivational component (students' motivation for learning terminology, which is used in professional communication) a questionnaire has been developed, the results have been differentiated according to the levels: satisfactory, good, very good, and excellent. The measurement of cognitive component (the knowledge of the normative grammar within the minimum, which is necessary for the formation of terms, which are used in professional communication) has been conducted with the help of oral and written vocabulary dictations, test tasks, and semantic module tests, which were assessed at the following levels: satisfactory, good, very good and excellent. The verification of activity component (skills and abilities to form, translate and use terms in professional communication) has been carried out with the help of written

final control test and oral exam, which distinguished satisfactory, good, very good, and excellent levels.

RESULTS AND DISCUSSION

From 2017 and 2020 practical classes in Latin were conducted with the use of modern technologies at the National Medical University named after O. O. Bohomolets to ascertain the effectiveness of the use of modern technologies in the management of the formation of communicative competence of the future healthcare specialists in the context of pharmaceutical market transformation. The levels of the components of communicative competence have been assessed before and after the experiment.

Table 1 below presents the distribution of some students in control groups and experimental groups according to their level (excellent, very good, good, and satisfactory) of each component of competence (motivational, cognitive, and activity) before the experiment.

Table 1. The distribution of number of students in CG and EG according to the level of the competence components before the experiment

Component of competence	Level	Number of students in CG	Number of students in EG
Motivational	excellent	26	43
	very good	30	51
	good	45	70
	satisfactory	10	20
Cognitive	excellent	5	6
	very good	31	52
	good	56	97
	satisfactory	19	29
Activity	excellent	8	13
	very good	31	52
	good	59	93
	satisfactory	14	26

Before the experiment, the distribution of students' levels of motivational, cognitive, and activity components was the following: "excellent" level of activity component was demonstrated by 7% of CG and EG students; of cognitive component – by 5% of CG and 3% of EG students and of motivational component – by 23% of CG and EG students; "very good" level of activity component was demonstrated by 28% of CG and EG students; of cognitive component – by 28% of CG and EG and of motivational component – by 27% of CG and 28% of EG students; "good level" of activity component was demonstrated by 53% of CG and 51% of EG students; of cognitive component – by 50% of CG and 53% of EG and of motivational component – by 41% of CG and 38% of EG students; "satisfactory" level of activity component was demonstrated by 13% of CG and 14% of EG students; of cognitive component – by 17% of CG and 16%

of EG and of motivational component – by 9% of CG and 11% of EG students **(Figure 4)**.
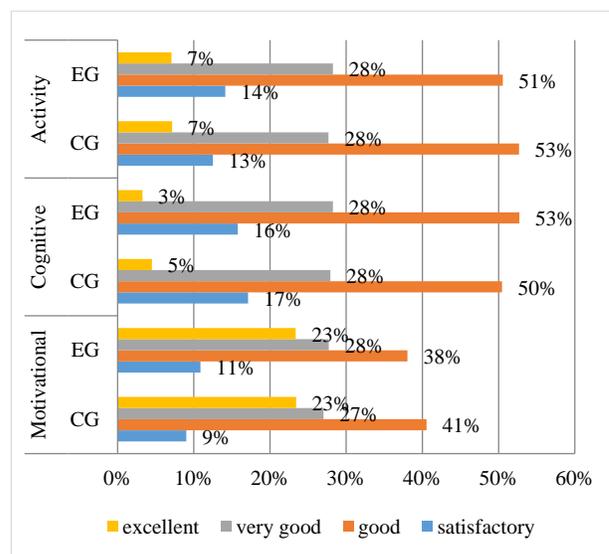
Figure 4. The distribution of the components of communicative competence in CG and EG before the experiment

Table 2 below presents the distribution of number of students in control groups and experimental groups according to their level (excellent, very good, good, and satisfactory) of each component of competence (motivational, cognitive, and activity) after the experiment.

Table 2. The distribution of number of students in CG and EG according to the level of the competence components after the experiment

Component of competence	Level	Number of students in CG	Number of students in EG
Motivational	Excellent	21	62
	very good	47	59
	Good	30	53
	Satisfactory	13	10
Cognitive	Excellent	6	15
	very good	20	58
	Good	72	107
	Satisfactory	4	1
Activity	Excellent	3	20
	very good	18	59
	Good	79	103
	Satisfactory	1	2

After the experiment, the distribution of students' levels of motivational, cognitive, and activity components was the following: "excellent" level of activity component was demonstrated by 3% of CG and 11% of EG students; of cognitive component – by 5% of CG and 8% of EG students and of motivational component – by 19% of CG and 30% of

EG students; "very good" level of activity component was demonstrated by 25% of CG and 32% of EG students; of cognitive component – by 18% of CG and 32% of EG and of motivational component – by 42% of CG and 35% of EG students; "good level" of activity component was demonstrated by 71% of CG and 56% of EG students; of cognitive component – by 65% of CG and 58% of EG and of motivational component – by 27% of CG and 29% of EG students; "satisfactory" level of activity component was demonstrated by 11% of CG and EG students; of cognitive component – by 12% of CG and 2% of EG and of motivational component – by 12% of CG and 6% of EG students **(Figure 5)**.
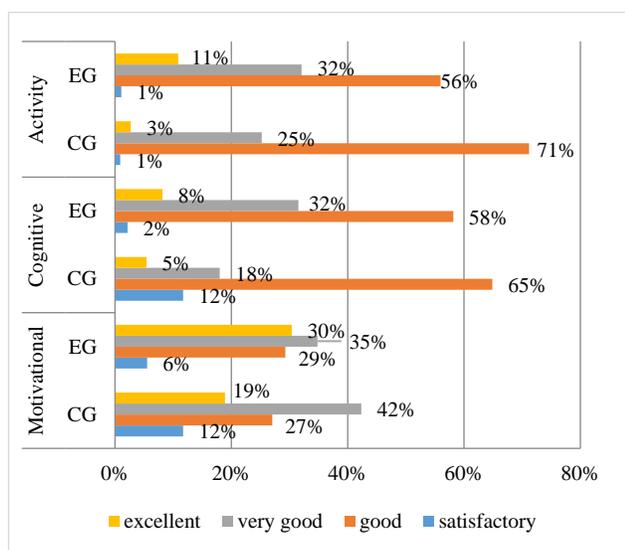
Figure 5. The distribution of the components of communicative competence in CG and EG after the experiment

Statistical analysis of data collected before and after the experiment of motivational, cognitive, and activity components of communicative competence has shown significant differences between levels (excellent, very good, good, and satisfactory) in CG and EG, which is the basis for the statistical significance of these differences when applying the modern technologies and web tools into the educational process. The findings prove the effectiveness of the use of modern technologies in the formation of communicative competence of future healthcare specialists during practical classes in Latin.

Pharmaceutical market transformation demands not only "product focused" role of the pharmacists, but also there is a high need in participating in coordination of care in collaboration with all health care professionals, supporting coordinated care delivery through a doctor. That is possible only through stable professional communication between doctors and pharmacists. The educational process should be organized making the emphasis on the formation of communicative competence of the future healthcare specialists to satisfy the professional communication at an advanced level while performing professional tasks and to minimalize the reasons of misunderstanding and the decrease of extemporal medicine production.

Modern educational programs of the future pharmacists training should change the accents from being academic-oriented to clinical-oriented. The performance of professional duties of pharmacists in the healthcare field is in close contact with doctors and is organically connected with the clinical component: mutual information about a new treatment, prevention and diagnostic methods, and drugs; compliance with the rules of drug use, mutual selection of effective drugs, forms and doses of the drug and a rational treatment regimen, etc. The use of modern technologies in the educational process can manage the formation of communicative competence essential in professional work.

This research study revealed several interesting findings about the role of modern technologies in the management of the formation of communicative competence of the future healthcare specialists in the context of pharmaceutical market transformation. Furthermore, some remarkable outcomes emerged in terms of the academic achievements of the students.

As shown in **Table 1** and illustrated by **Figure 4** the levels of motivational, cognitive, and activity components of communicative competence were rather disappointing.

The satisfactory level of a motivational component has been characterized by an insufficient level of motivation, the need for an initiative from others, no motivation to learn Latin as a discipline that contributes to the formation of communicative competence; of the cognitive component has been characterized by a lack of knowledge of vocabulary, normative grammar, which are essential for terminology formation and the satisfactory level of activity component has been distinguished by making lots of mistakes in the formation of terms and their correct use in communication.

The good level of the motivational component has been characterized by a positive but unstable motivation to study Latin as a discipline that contributes to the formation of communicative competence; the cognitive component has been defined by partial use of terminology in communication and of activity component has been determined by difficulties in understanding the correct meaning of terms.

The very good level of the motivational component has been characterized by a positive motivation to learn Latin and understanding that Latin contributes to the formation of communicative competence; a cognitive component has been defined by fluency in terminology and nomenclature and of activity component has been distinguished by the insignificant difficulties in using terms.

The excellent level of motivational component has been characterized by a stable professional terminological motivation, the desire for independent development and self-improvement, awareness of the value of learning Latin for the formation of communicative competence; of cognitive component has been characterized by a clear and fluent mastery of terminology and nomenclature, normative grammar and of activity component has been defined by confident, fast and correct use of professional terms in communication, no errors are made.

As shown in **Table 2** and illustrated by **Figure 5** the levels of motivational, cognitive, and activity components of communicative competence have been improved because of the use of modern technologies and web tools in the educational process.

The aim of the study was achieved by the completion of the outlined tasks. Due to the comparative analysis of the results, obtained before and after the experiment, the effectiveness of the use of modern technologies in the management of the formation of communicative competence of the future healthcare specialists has been proved.

Technologies and web tools can be changed and altered according to the stage of the practical class: preparatory stage, main stage, and final stage topics or to the students' needs. For future research, the following directions should be highlighted: estimate the level of digital skills of the students and their motivation to use modern technologies and web tools during different types of classes to form those skills for future professional work.

Conclusion

The conducted research allows us to conclude that the use of modern technologies for practical classes at the National Medical University named after O. O. Bohomolets has shown significant effectiveness in the management of the formation of communicative competence of future healthcare specialists. Students demonstrated a high level of motivational, cognitive, and activity components of communicative competence. The stages of practical class (preparatory, main, and final stages) were preserved, being supported, and organized with different modern technologies and web tools. Unfortunately, the following problems occurred: difficulty to get the access to a course: limited, slow or the lack of internet; problems with devices or equipment: old computer or smartphone, broken camera, no headphones, and microphones, etc; difficulty to keep up with deadlines: control tests can be closed after the deadline. The use of modern technologies has a lot of advantages, as they can make the process of evaluating students' works easier for a teacher; the studying materials are available at any time and can be received through the visual or audial way. Moreover, during the pandemic situation with Covid-19 students can stay at their homes; the social distance is preserved as students are not gathered at one classroom, sitting close to each other.

Furthermore, our findings can be extended by future research, which will investigate the management of the formation of digital skills of future healthcare specialists.

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