



Information And Communication Competence of Future Teachers in The Context of Studying the Humanities

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ABSTRACT

The article concerns the issue of the development of future teachers' information and communication competence in the context of studying linguistic and literary disciplines. The model of development of future teachers' information and communication competence proposed by authors is based on systematic and purposeful individual or teamwork with media content, online tools, programs, and digital apps (PowerPoint, Thinglink, Canva, Glogster, Genially, Mentimeter, Wordart, Padlet, Learning Apps, Wordwall, MindMeister, Flipgrid, Coggle (MindMap), Mindomo, Kahoot! and others). It concerns the search, analysis, assessment, and selection of information; involves the use of ready IT products as well as the creation of own, safe interaction in the information space. It has been tested during the 2021-2022 academic year (130 Ukrainian students).

The effectiveness of the authors' model in the process of the result comparing diagnostics of the formation level of the 3rd year students' information and communication competence at the beginning and after studying language and literature disciplines has been proved empirically.

The pedagogical conditions for the formation of future educators' information and communication competence are defined as the use of ICT in all humanitarian classes and the creation of the information and education environment aimed at the development and improvement of students' digital literacy skills, implementation of online tools; updating of digital resources for the search, analysis, systematization, storage, presentation of information; reproductive, constructive and productive tasks aimed at active use of ICT during education; independent preparation of high-quality media content as the results of individual or group projects.

Keywords: information and communication competence; future teachers; linguistic disciplines; literary disciplines; digital tools.

1. INTRODUCTION

The problem of the development of teachers' information and communication competence has been actualized by several main factors, including the development of IT technologies and digitalization of all social spheres, the introduction of distance learning due to the quarantine, and in Ukraine – due to the war. The compulsory result of the professional training of a modern educator of “Primary Education” and “Philology” specializations is the formed integral (the ability to solve complex specialized tasks and practical education problems with awareness of responsibility for one's actions), general and special (professional) competencies. For future primary school teachers, the specialty also requires “the ability to navigate in the information space, use open resources, information and communication, and digital technologies, and operate them in professional activities” (Standard of Higher Education for Specialty 013 “Primary education”..., 2021). For philologists, the general competencies include “skills in the use of information and communication technologies” (Standard of higher education of Ukraine..., 2021, p. 8). Teaching each school class has its specifics. In addition to the general abilities and skills of working with digital resources, the teacher must be able to use them methodically and correctly to implement the content and tasks of each educational field. New methodological applications using IT technologies significantly increase the quality and efficiency of the educational process, and make it

interesting and modern. After all, distance learning is possible only if the digital literacy of teachers and students is formed at least at a sufficient level. This fact determines the relevance of the research topic.

The purpose of the article is to indicate the peculiarities of the development of information and communication competence of future primary school and foreign language teachers in the process of linguistic and literary education, in particular during the study of the discipline “Children’s literature and teaching methods of literary reading”, “The English language”, and “The German language”.

In this research, we focus on the analysis of the key components of future teachers’ information and communication competence. We highlighted the features of linguistic and literary education of future primary school and foreign language teachers, based on the experience of their psychological and pedagogical training in Ukrainian universities. We demonstrated individual examples of systematic work with students in the process of studying the Humanities; implementing their content and tasks using digital tools. We defined effective pedagogical conditions and offered the author's model for the development of future teachers’ information and communication competence in the process of learning a foreign language, children’s literature, and the method of teaching literary reading. We diagnosed the level of formation of information and communication competence before and after studying the specified disciplines (the 3rd year students of Vasyl Stefanyk Precarpathian National University and Ivan Franko National University of Lviv, Ukraine).

2. MATERIAL AND METHODS

2.1. Analysis of recent research and publications

In recent decades, many studies have appeared concerning the issue of the development of information and communication competence. Information and communication competence means a person's ability to navigate in the information space, operate with data based on the use of modern ICT to meet the needs of the labor market and fulfill professional duties effectively. This concept should also include such elements as value orientations, that is, a critical view and critical analysis of information and data making the content obtained from various sources and with the help of ICT.

Future educators’ information and communication competence is composed not only in the process of studying informatics but also primarily in the process of practical use of computer technologies when solving theoretical and methodical tasks from a variety of different disciplines. Thus, while studying a foreign language and the methodology of its teaching, children's literature and the methodology of literary reading, students work with various information products, create their own, demonstrating the ability to use IT technologies to analyze and present literary material, implement creative ideas and let them get the gist of what they were reading.

The development of educators’ information and communication competence as the main objects of the educational process is currently a key aspect in the educational systems of economically developed countries of the world.

The information and communication competence of teachers and students is considered today a compulsory condition for the implementation of the educational process. If its participants do not possess elementary knowledge, skills, and information literacy skills, as a result, they need constant support or accompaniment, which greatly complicates the educational process, or even makes it impossible.

Let's consider the scientific works on the problem, summarize the main aspects of the research results and identify the points left out of attention and needed to be refined, in Table 1.

Table 1: The scientific works on the problem

Author, name of the work. *** Problem and the purpose of the research.	Results and recommendations	Aspects to be outlined and / or specified
Ovcharuk, O. V. (2013). Information and communication competence as a subject of discussion: international approaches. *** Analysis of the concept of "information and communication competence" was carried out, taking into account international approaches.	“Information and communication competence is included in the list of key ones in the main strategic international documents, it is end-to-end, multifunctional, and can be applied in various spheres of life” (Ovcharuk, 2013, p. 4). O. Ovcharuk defines the concept of “the teacher’s digital literacy” as the ability to set a task and manage it; to search and use information, focusing on the purpose of the educational activity and the audience; to inform and determine their methods and ways of solving the problem (Ovcharuk,	There are several synonyms of the concept “digital competence”: “digital literacy”, “information competence”, “information literacy”, “computer competence”, “computer literacy”, and “information literacy” as well as “technological competence”, “technological literacy”, “ICT skills”, etc. The concept of "information and communication competence" needs to be specified in the context of the specialist's pedagogical activity.

	2013, p. 5). In international scientific studies, the concept of "information and communication competence" is not limited to the technological or digital field, but involves a wide context, and various aspects of human life.	
Bykov, V. Yu., Spirina, O. M., Ovcharuk, O. V. (2010). Fundamentals of Standardization of Information and Communication Competences in the Ukrainian Education System: method. recommendations. *** Main approaches to standardization of information and communication competences for the general system of secondary education	O. Ovcharuk and O. Spirin defined four major components of this competence: 1) capacities and skills to gain, work with information and interpret it critically; to use ICT in professional activities; 2) understanding the information content of a related field, the principles of information security, and functional parameters and capabilities of information and communication technologies; 3) ICT skills, computer technology, gadgets, etc.; 4) perspective: the use of ICT in social interaction and responsible behavior concerning technology use (Fundamentals of Standardization of Information and Communication Competences..., 2010, pp. 46-48). Recommendations for the draft standards from information and communication competences of teachers. Description of indicators for information and communication competent applications using the ISTE approach and distinguishing six levels.	During the monitoring of the formation levels of students' information and communication competence, we partially take into account these results and recommendations. Indicators of the formation of information and communication competence of future teachers need to be clarified, taking into account the specifics of the implementation of the content and tasks of language and literature education.
ICT competency standards for teachers: competency standards modules (2008). *** The ICT-CST project (ICT Competency Standards for Teachers, 2008) specifies the general list of skills necessary for a modern teacher's pedagogical activity and relates to the use of ICT in the educational process.	Three approaches are provided here as a systematic algorithm for pedagogical development in this field. We are analyzing the following approaches: "Technological literacy" – the use of ICT for effective teaching; "Deepening of knowledge", aimed at improving knowledge, immersive education, going beyond the school curriculum; "Creation of knowledge", which requires a creative approach and the production of new media products to increase the effectiveness of the educational process and the formation of a new generation of competent individuals.	The results of the research are taken into account in the development process of the author's model for the development of future teachers' information and communication competence in the process of learning a foreign language, children's literature, and the method of teaching literary reading.
Konoshevskiy & Konoshevskiy (2013). Formation of information and communication competence of future teachers of mathematics. *** The paper describes the problem of formation of methodical and information cultures future mathematics teachers of	They consider information interaction in the format of "a human being-computer" dialogue as a means of obtaining and analytical processing, storage, sharing, and integration of information; realization of personal creative qualities, and development of new scientific and social experience (Konoshevskiy & Konoshevskiy, 2013, pp. 41-42). Information methodical culture includes: information culture, self improvement; informational and methodical culture of methods of	The author does not offer models for the formation of information and communication competence of subject teachers, does not reveal the essence of the named components of competence. The components of the specialist's information culture require detailing.

<p>information and communication technologies</p>	<p>professional activity; informational and methodical culture of studying computer technology; informational and methodical culture of studying ICT; informational and methodical culture of methods of search activity</p>	
<p>Fedoruk, H. M. (2015). Formation of information and communication competence of future technology teachers in the process of professional training. *** Definition, theoretical justification, and experimental verification of pedagogical conditions for the formation of information-communication competence of future teachers of technologies in education environment of a pedagogical university.</p>	<p>Fedoruk H. considers information and communication competence as a person's integral characteristic, manifested "in the ability to comprehend knowledge, and achieve goals in the particular field with the help of a computer" (Fedoruk, 2015). The researcher is convinced that a teacher must be proficient in IT technologies to manage professional activities efficiently and effectively. Thus, it is possible to distinguish two components of information and communication competence – personal-professional, and informational. In the context of the latter, let us consider three components: information, computer (determines a specialist's general competence), as well as procedural-operational (determined by the content and direction of professional activity, meaning the use of IC technologies to solve professional tasks).</p>	<p>The ways of formation of information and communication competence of specialists in these fields, which differ from the technologies of the field of education, remain outside the attention of researchers.</p>
<p>Furman & Kostyuchenko (2013). Formation of information and communication competence by means of ICT professional training of subject teachers. *** Considering the information and communication competence in the field of teachers' professional activity in the digital conditions of the educational system.</p>	<p>The scientists are convinced that the purposeful and independent use of ICT in educational activities, as well as in the process of methodical and research work, is evidence of the possession of this competence; maximum use of the prospects of digital technologies in the process of setting and managing pedagogical tasks. Information competence of a subject teacher includes general, diagnostic, subject-oriented components. Informative courses contribute to their formation in future teachers.</p>	<p>The author does not assume that the information and communication competence of future teachers should be formed in the process of studying other courses, in the context of the development of methodical culture</p>
<p>Lavrenova, M., Lalak, N. V., & Molnar, T. I. (2020). Preparation of Future Teachers for Use of ICT in Primary School. *** Suggested the analysis of some aspects of future teachers training to use ICT in the educational environment of primary school.</p>	<p>The authors characterize the functionality of information and communication technologies, focus on modern computer aids that can be used in the education and upbringing of younger students. Information training of future elementary school teachers, which activates their cognitive and creative potential, generates the knowledge and skills needed for future professional activity, is of great importance.</p>	<p>The authors consider the possibilities of using various information technologies at the stages of the lesson in primary school, but to a lesser extent they touch on the issue of the formation of future teachers' skills in using them.</p>
<p>Røkenes, F. M. (2016). Digital storytelling in teacher education: A meaningful way of integrating ICT in ESL teaching. ***</p>	<p>The study reports on two iterative design cycles of a DST workshop held at a Norwegian teacher education program. Findings point to a number of approaches that can be used in the workshop design such as modeling ICT integration and</p>	<p>The author considers only storytelling techniques, but does not consider in detail other methods, techniques and means that allow forming the information and communication competence of</p>

<p>The use of digital storytelling (DST) in teacher education can help develop digital competence in secondary school English as a second language.</p>	<p>assessment, scaffolding student-active learning experiences with ICT, and linking theory and practice through reflection.</p>	<p>teachers in the process of learning a foreign language.</p>
<p>Plakhotniuk, G., Liubchenko, I., Prokhorchuk, O., Yuzyk, O., Turchak, A., & Markova, O. (2021). Formation of Future Specialists' Information Competence/ *** The formation of information competence of future interpreters' in professional training as a pedagogical problem has been considered.</p>	<p>“The transition from static information websites to dynamic ones, involving the use of multimedia simulators for teaching, simple learning modules, complex distribution learning systems, e-course, open portal boards for members of the learning community and parents, interuniversity training courses” are important (Plakhotniuk, Liubchenko, Prokhorchuk, Yuzyk, Turchak, & Markova, 2021, p. 57). In Hanna Plakhotniuk’s opinion, the creation of an interactive learning environment will solve the problem of students’ (future philologists and translators) information and communication competence development.</p>	<p>The author substantiates the effectiveness of an interactive educational environment and the use of multi-level information tasks, information and cluster technologies, computer modeling in the formation of information and communication competence of translators, but does not describe the methods of working with these tools in the context of studying philological courses.</p>
<p>Kononets, Nataliia, Baliuk, Victoria, Zhamardiy, Valeriy, Petrenko, Lesya, Pomaz, Yuliia, Kravtsova, Nadiya, Shkola, Olena (2021). Didactic model of information and communication competence formation of future specialists of economic. *** Experimentally testing the effectiveness of didactic conditions and modeling the process of acquiring the information and communication competence by future economic profile specialists in the educational environment of the university.</p>	<p>The didactic model of formation of information and communication competence of future economists incorporate the structural blocks: motivational-target, information-content, operational-effective and diagnostic-effective. Ефективності формування інформаційно-комунікаційної компетентно ком сприяють такі дидактичні умови: «the creation of electronic educational resources for the formation of information and communication competence of future economic professionals; introduction of the training studio «Digital technologies in the work of an economist» as means of continuing education in the training of future economic professionals; complex pedagogical influence on the goal-setting, motivational, information-cognitive, activity sphere of the personality of future economists by means of coaching; orientation of the educational process on the application of technology-oriented learning; involving students in the development and implementation of network projects» (Kononets, Baliuk, Zhamardiy, Petrenko, Pomaz, Kravtsova & Shkola, 2021, p. 180)</p>	<p>The authors offered an interesting didactic model of formation of information and communication competence of future economists, which can be used in the process of training other specialists only partially, because it does not take into account the specifics of other fields, including philology.</p>

The analyzed works became the theoretical basis of the study. However, the problem of the development of information and communication competence of university students, future primary schools, and foreign language teachers in the process of studying the humanitarian disciplines has not been researched properly. In-service teachers’ attempts to fill this niche are sporadic. Among the proposals, practical developments in the use of IT technologies in the process of studying certain disciplines, methodological recommendations for working with certain services, programs, and online tools (T. Blyznyuk (2019; 2020), O. Dziabenko & O. Budnyk (2020), O. Budnyk, N. Matveieva, K. Fomin, T. Nazarenko & V. Kalabska (2021)), T. Kachak (2021),

T.Kachak & Kh. Kachak (2022)), experimental studies of the growth of the role of ICT in teaching foreign languages and the integration of various activities in the future specialists' training (Vovchasta, Kozlovska, Opachko, Paikush & Stechkevych, 2021).

This research requires systematization and generalization for the further theoretical understanding of such practical experience, and the development of an effective methodical system or model for solving the problem of information and communication competence of future teachers during the study of the Humanities.

2. 2. Research Methods

The method of theoretical and comparative analysis was used to clarify the definition of the concept, and to give a comprehensive assessment of psychological, pedagogic, and sociological research. The empirical methods (surveys, questionnaires, observations, homework checks) were actualized to determine the level of the development of information and communication competence of future teachers, and methods of mathematical statistics were effective during the quantitative and qualitative analysis of the results of empirical research. The monitoring of the current state in the context of the research problem in contemporary university educational practice was conducted in two Ukrainian universities (Vasyl Stefanyk Precarpathian National University and Ivan Franko Lviv National University), where 130 future teachers took part in our survey (1 group, 32 students of LNU studying German; 2 groups, 48 students studying Children's Literature, and 2 groups, 50 students studying English at PNU). All participants agreed to take part in the experiment, which lasted for 10 months (from September 2021 to June 2022) ensuring ethical standards and procedures for research.

We surveyed their level of the development of information and communication competence and the reason they used information and communication technologies in pedagogical practice, what online programs and tools they preferred.

The selected diagnostic tools formed the basis for determining the development of students' information and communication competence at three levels: basic, course-oriented, and professional.

3. RESULTS

Pedagogical staff, who are tasked with teaching and educating the younger generation, creating a personality of the information society, "must, on the one hand, meet the criteria of an information personality, and on the other hand, possess innovative technological tools and apply them competently in the professional-pedagogical activity" (Timofeeva, 2017, p. 7).

The development of students' information and communication competence is based on systematic and purposeful information activities, that is, the use of ICT for active interaction between participants in the educational process, and studying the content and methods of all courses. Search and presentation of information using ICT is the result of students' information activity, which should be organized by combining traditional and new methods and approaches to the organization of education. Thus, very effective proved to be forms of individual, group, and teamwork; game and interactive classes; use of project technologies and flipped learning, search and research tasks, and creative exercises.

The hypothesis of our research is the statement that high-quality teaching of the Humanities and purposeful and systematic use of digital tools focusing on the methodology of teaching school courses will contribute to the effective development of the information and communication competence of future teachers, the development of their high level of professional and informational skills and capabilities.

We have developed and tested the methodical models of working with students during the study of three disciplines of the humanitarian cycle: the German language and methods of teaching it at school by future foreign language teachers; the English language and methods of teaching it at school, as well as Children's literature and methods of teaching literary reading by future primary school teachers.

Regarding the trends of reducing the student workload, integration of disciplines, and changes in curricula considering the ratio of normative and elective disciplines, we have observed the merging of theoretical courses (the content of language and literary education) with the methodology of teaching these courses at school.

Thus, teaching the course "Children's literature and methods of teaching literary reading" at Vasyl Stefanyk Precarpathian National University is provided by the curriculum of the integrated course. The main goal of studying the discipline is to familiarize students with Ukrainian and foreign literature for children, to develop students' literary competence, and their reading culture, the methodology of teaching literary reading in primary school, and promotion of children's reading. The content of students' education is formed by artistic texts of Ukrainian and foreign writers, literary and psychological-pedagogical works addressed to young readers, historical-literary, receptive-critical materials, as well as normative documents, reading textbooks for primary school, methodical recommendations, the pedagogical experience of practicing teachers (Kachak, 2021). A positive aspect of such an integrated course is that the processing and analysis of artistic texts are accompanied by methodical work and practical approbation of tasks, forms, and methods of educational activity relevant in primary school, in particular, for the development of literary competence (reading, literary, personal and activity, library and bibliographic) of students.

The integrated courses, which synthesize the study of English and German and the methodology of their teaching at school, provide the opportunity to study and master the content of language education (acquiring the language: What to study?) and methodology (How to teach language material and organize work in the lesson, what forms and methods should be updated, what digital tools should be used?).

An important component of the goal of each discipline is teachers' media literacy and the capability to use digital tools as a means of implementing the content and tasks of linguistic and literary education. In the process of studying disciplines, we master resources that allow us to create presentations, infographics (Canva), tasks, simulators (LearningApps, WordWall), online exercises, and resources-extremely easy-to-use tools that allow learners to collaborate online (Hueber, Klett, Cornelsen; YoPad, Padlet), interactive posters (Thinglink, Glogster, Genially), mind maps (Mindomo, Mindmeister), and other interesting educational applications. This experience is analyzed in the articles "Digital tools of literary education of future primary school teachers in distance learning conditions" (Kachak, 2021), "Mind Map" (Kachak T. & Kachak Kh., 2022), "Boom in Distance Learning..." (Blyznyuk, Budnyk & Kachak, 2021).

Let us consider the examples of the stages of working with students during the study of children's literature and methods of teaching literary reading and studying the writer's creativity, aimed at increasing their information and communication competence (Table 2-4).

Table 2: Use of digital tools during the study of the course "Children's literature and methods of teaching literary reading"

Work content	Digital tools, online services
1) Creation of the writer's portfolio, and selection of interesting forms of presentation of the writer's biographical facts, relevant to elementary school.	Canva, PowerPoint, DeepStory (the technology that makes it possible to animate portraits, photos, and add voice), Flipgrid
2) Discussion and analysis of the writer's work; development of a lesson fragment on the study of this work with primary schoolchildren.	Coggle (MindMup), Glogster, Thinglink, Genially Mentimeter, Padlet
3) Development and suggestions regarding the tasks used, aimed at the formation of reading, literary, personal-activity, and library-bibliographic competencies of schoolchildren during the lesson in class.	LearningApps, Wordwall, Wordart, Canva and other
4) The feasibility of using interactive forms of work in the process of analysis of the selected work with schoolchildren.	Glogster, Thinglink, Genially Mentimeter, Padlet, Kahoot!
5) Development of methods of effective use of digital tools when studying.	Canva, Mindomo, Padlet
6) Optimal use of the artistic context and interdisciplinary connections.	Learning Apps, Padlet, Glogster, Thinglink, Genially, Padlet
7) Integration of language and reading in the process of analysis of the work.	Google tools
8) Other feasibilities of processing the work (extracurricular activities, activities aimed at promoting reading, using the book in the process of conversations with students, etc.).	Mindomo, Glogster, Thinglink, Genially, a program for creating QR codes, Google tools

Teaching the German language, it is possible to apply ICT to activities aimed at developing the basic skills necessary to overcome communication difficulties faced by students in real life. These include the competencies specified in the All-European Recommendations on Language Education (Gemeinsamer europäischer Referenzrahmen für Sprachen), in particular, socio-cultural, professional, linguistic, intercultural, and pragmatic competencies (Trim, North, & Coste, 2013). Here is an example of the use of digital tools in the context of educational activities:

Table 3: Use of digital tools during the study of the course “The German language”

Work content	Digital tools, online services
1) Explanation of grammar topics, rules, patterns	PowerPoint, Canva, MySimpleshow
2) Enrichment of vocabulary through learning new words and expressions	Quizlet; Kahoot!, Quizizz
3) Creation of an associative bush or word cloud before starting to study a new topic, as a pre-reading plan (PreP)	Mentimeter, Padlet
4) Co-writing (writing a story, a plan in groups, teamwork on grammar exercises)	Etherpad, Padlet, LearningApps, Miro
5) Presentation of topics for discussion, facilitating an effective discussion	Kialo, Padlet
6) Writing compositions (creating electronic books), supplementing them with audio-visual means	Book Creator
7) Work on the authentic audio material	Lyrics Training
8) Checking and assessment of the obtained knowledge	Kahoot!, Quizlet, Wordwall, LearningApps
9) Project work, which involves creating a video, presentation by students	PowerPoint, Canva
10) Recapitulation of knowledge gained in the process of working with the textbook	Online exercises created by textbook publishers, e.g. Hueber, Klett, Cornelsen, and others.

In the process of studying English and teaching methods for future primary school teachers, we practice various methodical options for different types of classes. Throughout the academic course Methods of teaching English with future primary school teachers, we practice various methodical options for different types of classes. For example, for presenting on topics it is very useful to apply tools for infographics (Canva) as they help visibility and better perception of the material, for finding out students’ opinion on some problem or question of discussion we practice AhaSlides or Mentimeter. Definitely interactive assignments by means of LearningApps digital tool or those for generating mind maps (Mindmeister) create an engaging learning environment. We also use tools Thinglink, Genially for working out interactive posters which efficiently combine theoretical and practical tasks. What deserves our particular attention are tools for formative and summative assessment of students’ learning outcome. For this purpose, Kahoot, Socrative and other educational applications are especially helpful.

Table 4: Use of digital tools during the study of the course “The English language”

Work content	Digital tools, online services
1) Discussion and analysis of the proposed topic for study in the English language classes in primary school, supplementing it with own creative ideas.	Canva, PowerPoint, Nearpod, Ahaslides, Thinglink, Genially, and others
2) Creation of fragments or templates of English lessons for primary school using appropriate interactive tasks and digital tools.	Mentimeter, Padlet, Coggle (MindMup), Ahaslides
3) Development of innovative tasks for the improvement of speech skills (listening, speaking, reading, writing) of primary school students, aimed at the formation of communicative, sociocultural, reading, and digital competencies and recommendations for their use.	LearningApps, Wordwall, Wordart, Canva, PowerPoint, Thinglink, Genially and others
4) Creation of tests (grammatical, lexical, communicative) for formative assessment of students’ knowledge.	Kahoot, Socrative, Nearpod, Mentimeter, Padlet, Google tools
5) Discussion of ideas for using digital tools and resources when studying certain grammar and lexical topics.	Canva, Mentimeter, Ahaslides, Padlet
6) Creation of tasks for the integration of material from Country Study, English literature for children, etc. during the analysis of certain topics in English lessons.	Learning Apps, Padlet, Glogster, Thinglink, Genially, Padlet
7) Presentation of potential ideas for integration of the	Canva, PowerPoint, Nearpod,

English and Ukrainian language lessons, English and I explore the world, English and Reading	Ahaslides, Thinglink, Genially, and others
8) Creation of scenarios for holding interactive extracurricular activities of various formats (online or offline) aimed at increasing students' English and multicultural competence	Mindomo, Glogster, Thinglink, Genially, for creating and reading QR codes, Google tools

Systematic work with ICT activates students' cognitive and creative activity and increases the effectiveness of pedagogical activities, because "they change the way scientific information is presented, provide individualization of learning, creating new forms of interaction between the teacher and the student in the process of solving various cognitive problems" (Lavrenova, Lalak & Molnar, 2020). In lectures and practical classes, during independent work and presentation of the authors' projects aimed at improving teachers' professional competence, we create optimal pedagogical conditions for the effective development of students' information and communication competence, implementing various methods, approaches, and tools. Our author's model for solving the problem in the context of language and literature education of future teachers combines five components:

- systematic and purposeful use of media content and digital tools in offline and online education;
- student individual and group work with media related to search, analysis, evaluation, and choice of information;
- analysis of texts, educational and methodological materials using ways to develop critical thinking considering the peculiarities of media content;
- creation of own media products, mastering of digital technologies necessary for the realization of pedagogical goals;
- communicative interaction and safe activity in the information space.

Pedagogical conditions for the development of future teachers' information and communication competence are defined as:

- use of ICT in all humanities classes and the creation of an informational and educational environment aimed to develop and improve students' digital literacy skills, implementing online tools;
- use of ICT by students to search, analyze, systematize, store, and distribute information;
- reproductive, constructive, and productive tasks aimed at the active use of ICT in education;
- independent preparation of high-quality media content for processing linguistic and literary material and pedagogical activities resulting in individual or group projects.

Our methodical system of studying the humanities through active use of digital tools involves a combination of different forms of work, and interaction and is aimed at the formation of three key components of students' information and communication competence – cognitive, motivational, and operational.

The essence of the cognitive component is the formation of students' awareness of the peculiarities of the use of information and communication technologies in the process of studying language and literary phenomena, assimilation of rules, obtaining spelling skills, or analysis of literary texts. To develop and deepen this knowledge, we provided short master classes to get acquainted with new digital technologies, programs, and services. Thus, during the formative stage of the experiment, we introduced students to the feasibility of creating multimedia presentations, infographics, booklets, posters, collages, and mind maps in the Canva program; taught them to perform tasks of various types in graphic design app LearningApps; presented the multifunctional service Kahoot; demonstrated how to create QR codes and use Padlet digital board effectively.

The motivational component of students' information and communication competence means realizing the personal importance and significance of ICT in educational activities, motivated use of digital tools for self-development, intellectual enrichment, learning new things, and most importantly, professional skills. To activate the process of self-discovery of the ICT feasibilities, we offered students independent work with those digital tools that were previously presented. So, students created a greeting card to a literary hero in the Canva program, and prepared questions for the text using Kahoot application. In addition, students were offered to complete game tasks in LearningApps (take a quiz, solve a crossword puzzle, play the game "Racing" or the game "The First Million" with a friend).

The operational component of students' information and communication competence can be developed only in the process of active practice of working with ICT in educational activities and creating media products. This level demonstrates the ability and skills, awareness of various programs, and active use of them to meet educational and professional needs. All components of the information and communication competence of future teachers are formed simultaneously in the process of educational activities and are improved during the independent performance of homework, preparation of projects, and additional tasks in various subjects.

To verify the effectiveness of the proposed methodical model of formation of information and communication competence of future teachers in the process of studying the humanitarian disciplines, we conducted the analysis of the level of development of information and communication competence among 3rd-year students at the

beginning (the assessment stage) and after studying the courses “The German language” at LNU and “The English language” and “Children's literature and methods of teaching literary reading” at PNU (the control stage). The formative stage of the empirical research lasted for one academic year (2021-2022) and 130 students were engaged (1 group, 32 students of LNU studying German; 2 groups, 48 students studying German, and 2 groups, 50 students studying English at PNU).

The classification of six levels (introductory, minimal-basic, basic, advanced, research, expert) was taken into account to formulate the content of information and communication competence concerning the use of ICT in education (Fundamentals of Standardization of Information and Communication Competences in the Ukrainian Education System, 2010, p. 51), suggested by S. Lytvynova (2011, p. 6). We took into account the corporate standard model of ICT competence of academic staff, developed by N. Morse and A. Kocharyan (2015, p. 24) based on the UNESCO recommendations, the European framework of information and communication competence, specifics of the academic staff activities. It is based on the following principles: realizing the importance of ICT in education, using ICT in education, scientific activity (for searching data, presenting the results of scientific activity based on the use of ICT), and professional development.

Based on the analysis, systematization, and generalizations of scientific recommendations regarding the indicators of educators' information and communication competence, we distinguished three levels of its formation: basic, course-oriented, and professional. Their criteria are given in the Table 4.

Table 4: Levels of formation of students' information and communication competence

Basic	Course-oriented	Professional
1) Understanding the role and significance of ICT for pedagogical activities. 2) Presentation of tasks, lessons, and activities using ICT at the elementary basic level. 3) Mastery of basic Microsoft Office user skills for the preparation of didactic materials and documents. 4) Online teaching using elementary programs and services for synchronous and asynchronous communication. 5) Sporadic participation in webinars and workshops to improve digital competence.	1) Use of ICT to solve non-standard, innovative professional problems of theoretical and practical nature. 2) Using existing and partially creating own media products, implementing technologies and resources, based on the requirements, content, and methodology of a certain course. 3) Use of various educational and test programs and ICT to evaluate, analyze, and summarize student educational achievements. 4) Creation of conditions for active cooperation with colleagues, parents, and students using ICT. 5) Continuous improvement of digital literacy, and mastering new resources and digital tools.	1) Creation of a bank (methodological case) of pedagogical skills for effective implementation of ICT (creation of electronic resources, programs). 2) The use of ICT and various teaching styles for the development of new methods of comprehensive development of students, implementation of project-based and other effective teaching technologies. 3) Promotion of own pedagogical ICT experience in a certain subject area, constant updating of e-portfolio, and the presentation of professional achievements in open resources. 4) Participation in contests of pedagogical skill using ICT. 5) Participation in educational projects and professional development courses as a trainer.

Students were asked to respond to the following questions: evaluate their level of information and communication competence; indicate which online resources are most often used in the process of studying linguistic and literary disciplines, at what level and for what purpose; determine the level of own skills to organize synchronous and asynchronous interaction with students; certify participation in events to improve one's digital literacy and experience in presenting one's development of didactic materials using ICT; determine the purpose of using ICT in education.

Besides, their projects using ICT which finished in September (the first project) and December (2nd project) 2022, were evaluated. For the course “Children's literature and methods of teaching literary reading”, students were offered to create a lesson on literary reading using ICT, and for the courses “The English language”, and “The German language” – the compilation of all topics with elements of monitoring the obtained knowledge.

The questionnaire results, pedagogical observation, and assessment of the completed homework proved the fact that basic-level respondents have elementary knowledge of the conceptual apparatus, realize the role and importance of ICT in professional activity, and can activate their cognitive skills, using ICT – based visualizing of educational material. Mostly the presentation of materials using PowerPoint and video programs were used. They can organize synchronous and asynchronous communication in distance education but have difficulties working with online services and do not have sufficient skills and capabilities to create their media products for

teaching or assessing students. Students with a basic level of information and communication competence are only partially familiar with the listed online services and digital tools. As a rule, they use less than five of the listed media products.

Respondents with a course-oriented level of information and communication competence demonstrated the ability to manage non-standard, innovative tasks using ICT. They use ready educational media products successfully, adapt them to their pedagogical needs and attempt to create their own. These students can organize online learning; demonstrate not only awareness but also fluency by implementing various tools and electronic means of teaching and assessing learners' achievements. Students with a course-oriented level of information and communication competence are familiar with and use more than ten ready media products from the proposed list of online services and digital tools. With the use of some programs, they successfully create their media products.

The achievement of the professional level of students' information and communication competence was evidenced not only by knowledge of the latest theories and fluency in a certain ICT field; analytical skills of working with digital information and promoting its safe use, as well as active development of individual and group Internet projects, use of various online services to create media products for educational activities (animated presentations, mental maps, interactive posters, online exercises, online – testing, game tasks, etc.). They use social networks and Internet resources in research activities actively. Such students constantly present their ICT achievements in education, take part in scientific competitions, and are involved in conducting training, master classes, and advanced training courses. Students with a professional level of information and communication competence use ready media products of almost all of the listed online services and digital tools. In addition, they create their media products in the specified applications and services.

The results of the empirical research define the effectiveness of the proposed model of development of future teachers' information and communication competence and allow us to analyze the dynamics of this process. Based on the assessment of digital literacy, at the beginning of the experiment, 117 students have a basic level, 13 students – a course-oriented one, while after a semester of studying the humanitarian disciplines with active use of ICT, we recorded 17 students' basic level, 104 students course-oriented one (Fig. 1).

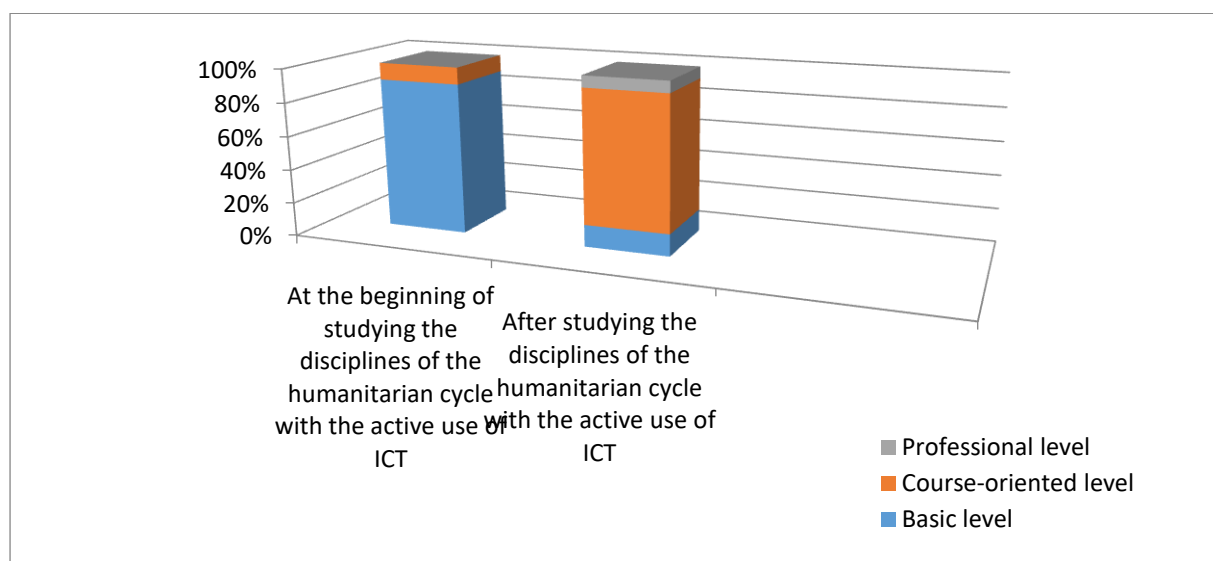


Figure 1: Dynamics of the level of students' information and communication competence based on self-assessment at the ascertainment and control stages of the experiment

It should be noted that at the beginning of the 3rd year, students responded that they acquired ICT skills at school (27.7%), while studying ICT at higher education institutions (36.9%), independently in the process of distance learning (35, 4 %). At the end of this course, the same respondents gave slightly different answers, taking into account the knowledge, skills, and abilities acquired during the formative stage of the experiment: at school (21.5%), while studying ICT (16.9%), independently in the process of distance learning (23.1%), while studying linguistic and literary disciplines as a result of the active use of ICT for completing tasks, preparing materials and creating didactic media products (38.5%) (Fig. 2).

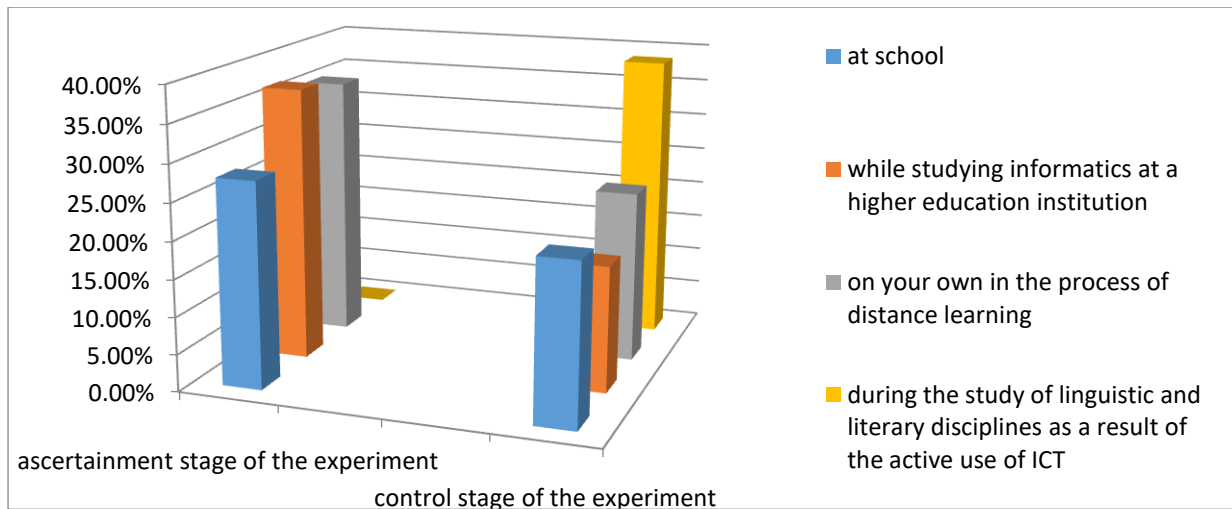


Figure 2: The source of students' acquired ICT in educational activities

The number of digital resources mastered by them for using and creating educational media products has also changed. We present a chart with data at two stages (ascertaining stage/control stage) regarding the number of students who are familiar with or work with the listed digital tools (Table 5).

Table 5: Students work with digital apps, programs, and tools

	unfamiliar		familiar		use ready media products		I create my media products	
	ascertaining stage	control stage	ascertaining stage	control stage	ascertaining stage	control stage	ascertaining stage	control stage
Google tools (information search, classroom work)			130	130	130	130		
PowerPoint	34		96	130	96	130	88	128
Thinglink	126		4	130	4	42	4	48
Canva	102		28	130	28	121	28	95
Glogster	128	18	2	112	2	51	2	33
Genially	126	14	4	116	4	32	4	38
Mentimeter	129	38	4	92	4	47	1	22
Wordart	117	53	13	77	13	49	10	32
Padlet	92		38	130	18	130	10	111
Learning Apps	103		17	130	17	110	16	94
Wordwall	118	18	12	112	12	77	10	44
MindMeister	130	68		62		59		43
Flipgrid	130	48		82		47		31
Coggle (MindMap)	118	34	12	96	10	54	2	46
Mindomo	130			72		23		12
Kahoot!	117		13	130	13	113	8	49
a program to create QR codes			130	130	105	130	25	130
others	113		17	42	17	42	8	24

At the initial stage, their projects, mostly PowerPoint presentations, sometimes with audio or video components, and animation correspond to the basic level of development of students' information and communication competence. After all, it is no surprise. Analysis of lesson notes and pedagogical experience of well-known Ukrainian teachers prove those multimedia products, in particular, presentations using texts, audio, and video materials, animation, graphics, and visual effects, interactive elements have become widespread in the educational process. Many teachers use ready presentations created by others and posted on educational community sites, but some create theirs. We can find a variety of presentation materials in education blogs.

We offered students to choose the most optimal answer to the question: "For what purpose do you use or plan to use ICT in the school educational process?" At the ascertainment and control stages of the experiment, the answers differed (* the number of respondents, ascertainment stage of the experiment/number of respondents, control stage of the experiment):

- for visual material presentation, preparation, and sharing 46 / 8;
- for the individual performance of exercises and tasks in various programs 12/4;
- for teamwork on projects 4 / 4;
- for testing 14/10;
- to search for information and methodical materials 18 / 22;
- to achieve various goals: searching and material presentation, individual and teamwork, checking students' knowledge and skills using apps 28/32;
- exclusively for the organization of distance learning 8 / 0.

It should be taken into account that 82 students at the control stage of the experiment responded that they use ICT constantly and for various purposes - for the preparation of didactic materials, presentations, infographics, and schemes; development of a system of exercises and tasks using digital programs; to determine the level of mastery of the material.



Figure 3: The use of ICT in the modern primary school practice

The last question concerned the effectiveness of the methodology of teaching the humanitarian disciplines, based on the systematic and purposeful use of digital tools to achieve professional goals and implementation of tasks. 90% of respondents (117 students) considered the authors' method effective and practically oriented.

4. CONCLUSIONS

By studying the humanitarian disciplines, future educators not only learn linguistic and literary material and master the methodological aspects of working with students at school, but also gain experience in the active use of information and communication technologies in their professional activities. Each topic of the disciplines "Children's literature and methods of teaching literary reading", "The German language", and "The English language and methods of teaching it" integrates knowledge about the content, methods of language or literary education, and digital tools that can ensure their effective implementation in the educational process of a modern school. Active formation of cognitive, motivational, and operational components of students' information and communication competence is taking place. The concept of "an educator's information and communication competence" is considered a person's ability to navigate in the information space, use ICT in educational activities purposefully, methodically, and research work; use ready and create media products. Based on these indicators, three levels of its formation among students are determined: basic, course-oriented, and professional. The proposed and tested authors' model of the development of future educators' information and communication competence in the context of studying the humanities is based on systematic and purposeful

individual and group work with media content, online services, programs, and digital tools (PowerPoint, Thinglink, Canva, Glogster, Genially, Mentimeter, Wordart, Padlet, Learning Apps, Wordwall, MindMeister, Flipgrid, Coggle (MindMap), Mindomo, Kahoot! and others). It is related to the search, analysis, evaluation, and selection of information; involves both the use of ready IT products and the creation of own, safe interaction in the information space.

In the process of the empirical stage of the research, the hypothesis has been confirmed: high-quality teaching of the humanities with active use of ICT and focus on course teaching methods contributes to the development of future teachers' course-oriented level of information and communication competence. The students participating in the formative stage of the experiment mastered new programs and services and learned to use the created digital products in the process of language and literary education methodically and correctly. At the control stage of the experiment (130 participants), 104 students demonstrated a course-oriented level of information and communication competence, while at the ascertainment stage, the knowledge, skills, and ICT skills of most of them (117 students) corresponded to the basic level. The proposed methodological schemes of the author's model of the development of information and communication competence of future teachers in the process of studying the disciplines of the language and literature cycle can be used partially or completely in teacher training at various universities.

Future research suggests a detailed analysis of the effectiveness of reproductive, constructive, and creative tasks with the use of ICT during the study of other disciplines by future teachers.

REFERENCES

1. Blyznyuk, T., Budnyk, O. & Kachak, T. (2021). Boom in Distance Learning During the Coronavirus Pandemic: Challenges and Possibilities. *Journal of Vasyl Stefanyk Precarpathian National University*, 8 (1), 90-98. <https://doi.org/10.15330/jpnu.8.1.90-98>.
2. Blyznyuk, T. (2019). Educational innovations and technological advancement in English language teaching: training teachers for NUS. *Scientific-pedagogical journal "Educational Horizons"*, 2 (23), 19-21.
3. Blyznyuk, T. (2020). Electronic educational resources as a means of forming digital competence of junior schoolchildren. *International Journal of Education and Science*, 3(2), 16. [https://culturehealth.org/ijes_archive/IJES,Vol.3,No2,2020\(4\).pdf](https://culturehealth.org/ijes_archive/IJES,Vol.3,No2,2020(4).pdf)
4. Budnyk, O., Matveieva, N., Fomin, K., Nazarenko, T., & Kalabska, V. (2021). Preparation of future teachers for the introduction of digital innovation in a rural school: problems and prospects. *Revista Brasileira De Educaçao Do Campo*, 6, e13124. <http://dx.doi.org/10.20873/uft.rbec.e13124>
5. Dziabenko, O. & Budnyk, O. (2019). Go-Lab Ecosystem: using Online Laboratories in a Primary School. 11th annual International Conference on Education and New Learning Technologies. Palma de Mallorca, Spain. 1st - 3rd of July, 2019. *EDULEARN19 Proceedings*, ISBN: 978-84-09-12031-4. <https://iated.org/edulearn/publications>
6. Fedoruk, H. M. (2015). *Formuvannia informatsiino-komunikatsiinoi kompetentnosti maibutnikh uchyteliv tekhnolohii u protsesi profesiinoi pidhotovky [Formation of information and communication competence of future technology teachers in the process of professional training]*: Ph.D. thesis. Vinnytsia. (in Ukrainian).
7. Furman, O., Kostyuchenko, A. (2013). *Formuvannia informatsiino-komunikatsiinoi kompetentnosti zasobamy IKT u profesiinii pidhotovtsi vchyteliv-predmetnykiv. Humanitarnyi visnyk Derzhavnoho vyshchoho navchalnoho zakladu [Formation of information and communication competence by means of ICT professional training of subject teachers]. "Pereiaslav-Khmelnyskyi derzhavnyi pedahohichniyi universytet imeni H. S. Skovorody"* [Humanitarian Bulletin of the State Higher Educational Institution "Pereiaslav-Khmelnyskyi State Pedagogical University named after H.S. Skovoroda"], 28 (1), 298 - 303. (in Ukrainian). http://nbuv.gov.ua/UJRN/gvpdpu_2013_28_1_58 .
8. ICT competency standards for teachers: competency standards modules (2008). UNESCO Digital Library website. <http://unesdoc.unesco.org/images/0015/001562/156207e.pdf>
9. Kachak, T. B. (2021). Digital Instruments of Literary Education of Future Primary School Teachers in the Conditions of Distance Learning. *Information Technologies and Learning Tools*, 86 (6), 144-169. <https://doi.org/10.33407/itlt.v86i6.4079>
10. Kachak, T, & Kachak Kh. (2022). Mind Maps as a Tool for Visualization and Structuring of Linguistic and Literary Material in the Process of Teaching Students. *Journal of Vasyl Stefanyk Precarpathian National University*, 9 (1), 92-100. DOI: <https://doi.org/10.15330/jpnu.9.1.92-100>

11. Kononets, Nataliia, Baliuk, Victoria, Zhamardiy, Valeriy, Petrenko, Lesya, Pomaz, Yuliia, Kravtsova, Nadiya, Shkola, Olena (2021). Didactic model of information and communication competence formation of future specialists of economic. *Journal for Educators, Teachers and Trainers*, Vol. 12(4). 170–181. <https://doi.org/10.47750/jett.2021.12.04.023>
12. Konoshevskiy, L. L. & Konoshevskiy, O. L. (2013). Formuvannia informatsiino-komunikatsiinoi kompetentnosti maibutnikh vchyteliv matematyky [Formation of information and communication competence of future teachers of mathematics]. *Problemy i perspektyvy formuvannia natsionalnoi humanitorno-tekhnichnoi elity [Problems and prospects of the formation of the national humanitarian and technical elite]: coll. of science pr. / edited by L. L. Tovazhnyanskyi, O. G. Romanovskiy*, Vol. 32–33 (36–37). Kharkiv: NTU “KhPI”, 38–44. (in Ukrainian).
13. Lavrenova, M., Lalak, N. V., & Molnar, T. I. (2020). Preparation of Future Teachers for Use of ICT in Primary School. *Revista Romaneasca Pentru Educatie Multidimensionala*, 12(1Sup1), 185-195. <https://doi.org/10.18662/rrem/12.1sup1/230>
14. Lytvynova, S. H. (2011). Informatsiino-komunikatsiinoi kompetentnosti vchyteliv zahalnoosvitnikh navchalnykh zakladiv [Information and communication competences of teachers of general educational institutions]. *Kompiuter u shkoli ta simi [Computer in school and family]*, 5, 6 – 10.
15. Morze, N. V. & Kocharian, A. B. (2015). Informatsiino-komunikatsiinoi kompetentnist naukovopedagogichnykh pratsivnykiv universytetu. Istorychnyi rozvytok formuvannia poniatinoho aparatu [Information and communication competence of scientific and pedagogical employees of the university. Historical development of the formation of the conceptual apparatus]. *Pedahohichna osvita: teoriia i praktyka. Psykholohiia. Pedahohika [Pedagogical education: theory and practice. Psychology. Pedagogy]*, 24, 20 – 31. http://nbuv.gov.ua/UJRN/Potip_2015_24_5
16. Ovcharuk, O. V. (2013). Informatsiino-komunikatsiinoi kompetentnist yak predmet obhovorennia: mizhnarodni pidkhody [Information and communication competence as a subject of discussion: international approaches]. *Kompiuter u shkoli ta simi [Computer in school and family]*, 7, 3-8. (in Ukrainian). http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?I21DBN=LINK&P21DBN=UJRN&Z21ID=&S21REF=10&S21CNR=20&S21STN=1&S21FMT=ASP_meta&C21COM=S&2_S21P03=FILE=&2_S21STR=komp_2013_7_2
17. *Osnovy standartyzatsii informatsiino-komunikatsiinykh kompetentnostei v systemi osvity Ukrainy [Fundamentals of Standardization of Information and Communication Competences in the Ukrainian Education System]: method. recommendations.* (2010). / Ed. Bykov, V. Yu., Spirina, O. M., Ovcharuk, O. V. Kyiv: Atika. (in Ukrainian).
18. Plakhotniuk, G., Liubchenko, I., Prokhorchuk, O., Yuzyk, O., Turchak, A., & Markova, O. (2021). Formation of Future Specialists' Information Competence. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(2), 57-77. <https://doi.org/10.18662/rrem/13.2/410>
19. Røkenes, F. M. (2016). Digital storytelling in teacher education: A meaningful way of integrating ICT in ESL teaching. *Acta Didactica Norge*, 10(2), 311–328. <https://doi.org/10.5617/adno.2431>
20. Standart vyshchoi osvity Ukrainy: pershyi (bakalavrskiy) riven, haluz znan 03 Humanitarni nauky, spetsialnist 035 “Filolohiia” [Standard of higher education of Ukraine: first (bachelor) level, field of knowledge 03 Humanities, specialty 035 "Philology"] (2021). (in Ukrainian). <https://mon.gov.ua/storage/app/media/vishcha-osvita/zatverdzeni%20standarty/2021/07/28/035-Filolohiya-bakalavr.28.07-1.pdf>
21. Standart vyshchoi osvity za spetsialnistiu 013 “Pochatkova osvita” haluzi znan 01 Osvita / Pedahohika dlia pershoho (bakalavrskoho) rivnia vyshchoi osvity [Standard of Higher Education for Specialty 013 “Primary education” of the field of knowledge 01 Education / Pedagogy for the first (bachelor) level of higher education] (2021). (in Ukrainian). <https://mon.gov.ua/storage/app/media/vishcha-osvita/zatverdzeni%20standarty/2021/07/28/013-Pochatk.osvita-bakalavr.28.07.pdf>
22. Tymofeieva, I. B. (2017). Formuvannia informatsiino-komunikatsiinoi kompetentnosti maibutnikh vykhovateliv doshkilnykh navchalnykh zakladiv [Formation of information and communication competence of future preschool teachers]. PhD thesis. Kyiv: National Academy of Pedagogical Sciences of Ukraine. (in Ukrainian). <https://nenc.gov.ua/wp-content/uploads/2015/01/Tymofeieva.pdf>

23. Trim, J., North, B., & Coste, D. (2013). Gemeinsamer europäischer Referenzrahmen für Sprachen: lernen, lehren, beurteilen. Klett Sprachen GmbH.
24. Vovchasta, N., Kozlovska, I., Opachko, M., Paikush, M., & Stechkevych, O. (2021). The Use of Information and Communication Technologies as a Means of Professional Foreign Language Training. *Revista Romaneasca Pentru Educatie Multidimensionala*, 13(3), 38-50. <https://doi.org/10.18662/rrem/13.3/439>