Developing digital and ICT literacy skills for future foreign language teachers: a comparative and action research approach

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Abstract

Digital and ICT literacy skills are essential for effective learning and teaching in the 21st century, especially for foreign language teachers who need to use various technologies to enhance their pedagogical practices and students' outcomes. However, the current state of pre-service teacher training programmes in different countries may not adequately prepare future foreign language teachers for the challenges and opportunities of integrating digital and ICT tools in their classrooms. This paper reports on an action research project that aimed to investigate and improve the digital and ICT literacy skills of future foreign language teachers in Ukraine, and to compare them with those of their counterparts in the USA. The project involved three surveys of students and teachers, as well as the implementation of several interventions based on the courses of Methodology of foreign language teaching and Practical course of foreign language. The paper also describes the positive practices and projects that contributed to the development of digital and ICT literacy skills among the participants. The paper discusses the findings and implications of the action research project, as well as the challenges and limitations posed by the pandemic situation. The paper concludes with some recommendations for further research and practice in this area.

Keywords

digital literacy, ICT literacy, foreign language teaching, pre-service teacher training, action research

1. Introduction

Teaching is a dynamic and complex profession that requires constant adaptation and innovation to meet the diverse and changing needs of learners. This is especially true for foreign language teachers, who face the challenge of integrating various digital and ICT tools into their pedagogical practices to enhance language learning outcomes and intercultural communication

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[1, 2, 3, 4, 5]. However, the rapid development and evolution of digital technologies also poses a problem for pre-service teacher training programmes, which may not be able to keep up with the current trends and demands of the profession. Therefore, future foreign language teachers need to develop their own digital and ICT literacy skills, as well as their ability to engage in continuous professional development, in order to be prepared for the realities and opportunities of the 21st century classroom [6, 7, 8].

Digital and ICT literacy skills are among the key competencies for lifelong learning and employability in the knowledge society, as recognized by various international organizations and initiatives. For example, the Decree of the President of Ukraine "On the Aims of Sustainable Development of Ukraine within the Period till 2030" states that one of the goals is to provide diverse and equitable quality education and opportunities for life-long learning for all Ukrainian people [9]. Similarly, UNESCO has been promoting the use of digital and ICT tools for educational reform and innovation, as well as for fostering intercultural dialogue and social inclusion [10]. However, the terminology and definitions of digital and ICT literacy skills have also changed over time, reflecting the complexity and diversity of this concept. According to the EU Skills Panorama, digital competences or ICT skills/digital competences refer to "confident and critical use of information society technology (ICT) in the general population and provide the necessary context (i.e. the knowledge, skills and attitudes) for working, living and learning in the knowledge society. Digital competences are defined as the ability to access digital media and ICT, to understand and critically evaluate different aspects of digital media and media contents and to communicate effectively in a variety of ICT influenced contexts" [11].

Daily digital discoveries and inventions, combined with the necessity of education adaptation to pandemic conditions, promoted blended and distance learning/teaching, favoured to learners' and teachers' deep diving into digital reality [12, 13, 14]. The educational institutions of all levels developed their own strategies of making education accessible to their learners. In higher pedagogical education it is important to develop the strategies of effective university learning / teaching under the new conditions as well as training future teachers for being ready to act professionally in a changeable pedagogical environment, containing unpredictable or force-major situations.

The *aims* of this paper are to study the opportunities for digital and ICT literacy skills development while pre-service teacher training. The focus is on the experience of Ukrainian universities and their educational programmes for future foreign language teachers.

2. Methods

The methodology of our research is presented with the procedure of action research.

The action research contained several stages according to the procedure of Chen [15]:

- identifying problem of meaning (starting point, kick off, notice, find interesting area, etc.);
- developing questions and examine assumptions (reflect and formulate questions);
- planning (choosing enquiry strategies, ways of gathering data, planning interventions);
- taking action (intervening);
- gathering data (wider evidence);

- analysing data (reflecting on wider evidence, qualitative analysis);
- interpreting data (assessing impact on teaching and learning);
- reporting (formulating recommendations);
- taking action (wider scale intervention).

Besides of the mentioned above stages and their specifications we added comparative analysis of the data and before taking an action we planned implementing new elements into educational process. After having taken the action we compared the expected programme results formation with the previous ones.

The issues of future foreign language teachers' pre-service training are rather well-studied, though there still are the aspects which have not been paid enough attention. Such an issue is the one associated with skills of handling with information and communication technologies. So, we have studied Ukrainian and foreign experience of the future foreign language teachers' digital and ICT literacy skills development.

The next stage of our research was the study which helped us to collect the data about Ukrainian and foreign university educational programmes for bachelors and identifying their potential as for digital and ICT literacy skills formation.

This study was aimed at answering the research question:

1. What are the programme opportunities for the formation of students' digital and ICT literacy skills?
2. How do these components contribute to future teachers' digital and ICT literacy skills development?
3. What are the most effective ways to train digitally and ICT aware teacher of foreign language?

Our analysis comprised the analysis of all components of educational programmes giving the necessary information and qualitative data of the competences to be developed and the expected results as well as educational components contributing to their achievement. Ukrainian and American programmes were compared with the educational programme for future teachers of English implemented in Bogdan Khmelnitsky Melitopol State Pedagogical University.

The stage of interpreting data was realised by means of assessing impact of the educational programme content on teaching and learning. It was studied as the dynamic system of educational components, extracurricular activities, continuing process of amending and renovation of the content, methods, forms, means, modes and approaches to teaching and learning. The results of the tailor-made course "Information and Communication Technologies in Learning and Teaching" implementing were analysed together with other components of the educational programme. This course was especially valuable as a part of the course "Methodology of English Language Teaching", which proved to have the effective combination of content, modes of interaction, motivation and outcomes.

Taking action, in this case is sharing the results of all the previous stages of our action research as the positive practice of creating the student-centred educational environment with the focus on development of future teachers' 21st century skills. To prove that the educational programme under consideration could really enhance the technologies impact in the classroom taught by its graduates, we analysed and interpreted the data gained from its content and from responses of students, teachers and graduates about learning and teaching within its functioning.

3. Results and discussion

Each year university education becomes less accessible as the requirements for the matriculation are changing and becoming stricter. The quality of university education is now under profound renovation as, on the one hand, the Ministry of Science and Education emphasizes on high quality specialists' training based on modern demands and world standards; on the other hand, the National Agency for Higher Education Quality Assurance crucially has changed the procedure of accreditation of educational programmes and subsequently the criteria for their evaluation. Besides of quite reasonable and expected conditions for continuing change of higher education, there is one more unpredictable and sudden factor challenging its functioning such as the pandemic.

Nowadays most of educational programmes in Ukraine are renovated annually. The head of educational programme together with its staff have to analyse all stakeholders' needs and improve it in accordance with them. The authors of the article while being the heads of educational programmes for future teachers of foreign languages have decided to study the opportunities for digital and ICT literacy skills development while pre-service teacher training within their educational programmes. The comparative analysis with the focus on the experience of Ukrainian and foreign universities and their educational programmes has been realized.

It goes without saying that the study of existing experience and positive practices was based not on the educational programmes content only, but also on its dissemination in scientific and methodological resources. During our work with relevant researches we have discovered that in spite of the numerous works revealing the importance of digital and ICT literacy skills for any teacher, great advantages of ICT used in the process of learning and teaching foreign languages, the issue of digital and ICT literacy skills development as one of the key components in future foreign language teachers training have not been thoroughly investigated yet.

Diving into the topic of our study it would be relevant to mention Gavin Dudeney's recollections of his being a student in 1970s-1980s and understanding of literacy and numeracy as the 'three Rs' (reading, (w)riting and (a)rithmetic). He states that "times have changed, and the notion of 'literacy' in the wired world of 2014 is a completely different beast" [16]. The researcher with co-authors Nicky Hockly and Mark Pegrum have created a taxonomy of the new digital literacies "by breaking them down into four main areas: those with a focus on language, on connections, on information, and on (re)design" [16]. A focus on language is specified with print and texting literacies, mobile, gaming, hypertext, code; a focus on connections – with personal, participatory, network and intercultural literacies; a focus on information – with search, information and tagging literacies; a focus on (re)design is associated with remix literacy. Speaking about incorporating a focus on both digital literacy and 21st century skills into a language class, Dudeney [17] emphasises ensuring the learners acquire an integrated level of proficiency with technology, digital literacy and 21st century skills, which should be of benefit both in further study, and in professional contexts.

Houcine [18] presented a "language training centre" in an Algerian university where ICTs are an integral part of the teaching practices and described its positive effect on learning and teaching foreign languages with such benefits:

- students develop better listening skills due to regular exposure to audio materials (audio

and video recordings – authentic and software, podcasts, pronunciation software);
- selection of updated articles from the Internet contributes to learners' awareness of the language (grammar skills, coherence in committing ideas, syntax...) and of the specific scientific editing/presentation (scientific texts, reports);
- teachers reported on their learners being engaged, motivated and attentive;
- ICT impacted positively on students' proficiency. A majority of students got better scores in their fields after attending language courses at the MLC;
- students increased their ability to take notes effectively; i.e., they were more likely to listen to the teacher and grasp the message, select the appropriate information and take notes that will be further exploited;
- the enhancement of linguistic competence combined with motivation and challenge led to more autonomy and initiative (to do research on the Web, to propose links, to use online dictionaries and encyclopaedias).

The research presented by Hadef [19] describes the survey conducted in the department of foreign languages with 30 students whose age ranges between 18–22 years old and 4 university teachers to assess the application of ICTs in the teaching and learning process. Students' and teachers' attitudes to ICTs application were studied and the following recommendations articulated: "University/school have to prepare to a digital society; develop a policy based on its own vision; make use of more digital tools; provide sufficient material; provide an academic training for teachers on how to use ICT's in teaching; prepare an equipped rooms; use video Conferences to present lectures" [19].

One of the most relevant studies of the issue is revealed by Guillén-Gámez et al. [20] whose work has demonstrated that "future foreign language teachers have a medium-low development of pedagogical digital competence. The result of this is that technologies are still not being used today for pedagogical purposes. The lack of pedagogical use may be due to the fact that the teaching staff do not have a solid initial pedagogical training with regard to the development of digital competence, which implies their limited use of ICT, as well as their tendency to only use the best known tools on the market" [20]. The researchers discovered that future teachers have an adequate motivation to use ICT, though there is still a lack of pedagogical consistency in their use, so they recommend educational institutions to motivate teachers by revealing benefits of using ICT.

Sevcikova [21] explored her students' responses to digital technology and its practical use for teaching purposes while TEFL training. Her action research took place in Saudi Arabia. The teacher-researcher discovered that her students believed that "technology is essential for the future; it enhances learning and teaching, supports collaboration and motivation. They also pointed out some limitations such as IT literacy, the time-consuming nature of technology, and the lack of access to free internet learning/teaching resources" [21].

It's crucial that there are specially designed courses for practising classroom teachers which can be used for future teachers. Such course is presented with Nik Peachey – the Blended Learning in ELT course. It is aimed at "developing teachers' understanding of the potential of blended learning for the development of English language skills" [22]. In spite of the fact that this course is tutored online the researcher's recommendations are of great use while improving university educational programmes for future teachers.

One more practical and useful research has been elaborated by Courts and Tucker [23] as they suggest multimedia items that can be easily implemented in the college classroom such as animation, slideshows, blogging, instant messaging, podcasting, and video on demand. The researchers state: "As new technologies emerge, both students and educators are often eager to find methods of assimilating these technologies in their college classroom experience" [23]. Integrating multimedia in the classroom can allow students to apply real-world skills, learn effective collaboration techniques, learn creative ways of expressing their ideas, and synthesize complex content [24]. Though the research dates back to 2012 its results can be used and positively influence learning and teaching in Ukraine even now.

Simultaneously with the analysis revealed in theoretical sources we paid our attention to the content of educational programmes for future teachers of foreign languages in Ukraine and in the US. So, under our consideration there were the educational programmes of Ball State University (USA), New York University (USA), Miami University (USA), Stony Brook University (USA), Izmail State University of Humanities (Ukraine), Volodymyr Hnatiuk Ternopil National Pedagogic University (Ukraine), Pavlo Tychyna Uman State Pedagogic University (Ukraine), Vasyl Stephanyk Pre-Carpathian National University (Ukraine) and Bogdan Khmelnitsky Melitopol State Pedagogical University (Ukraine).

The objects of our investigation within educational programmes were competences and results of learning correlated with educational components as for their potential for digital and ICT literacy skills development.

We found out that there are essential differences between Ukrainian and American programmes as the approaches to developing the programmes content differ. In Ukraine the focus is usually on the ICT issues closely related to core subjects, i.e. to Pedagogy and Methodology of foreign language teaching. In American programmes besides of the same educational components there could be found much more variety of subjects.

In Ukrainian programmes the expected results are associated with the creation of educational-methodological means and equipment and application; search, systematising, analysis and check of the information; creation of educational environment.

American programmes for future teachers of foreign languages contain components which help them to master technological approaches and meet the challenge of integrating technology with the teaching of foreign languages as well as allow them to get much deeper knowledge of ICT and dive into the digital world. There are such subjects as Introduction to Business with Integrated Computer Applications, Computer Apps for Design, Computer Applications in Graphic Arts, Technical Design Graphics, Computers and Society, Learning and Teaching with Emerging Technologies, Software Engineering (service), Space and Place in Human Communication, The Internet and Contemporary Art, etc. As we can see, there is no limitation associated with the future professional skills necessary in foreign language classrooms only. Foreign language teachers can freely choose the subjects which will significantly broaden their worldview and the system of competences.

The need for changes in the system of Ukrainian higher education launched the projects aimed at its modernisation and quality improvement. As Ukraine tries to be in line with European and world standards, international organisations help it to reform all levels of educational system. Recently the reform of pre-school education has just began, the UK Government and British Good Governance Fund support it; New Ukrainian School Concept is based on [25]; Ministry of

Foreign Affairs of Finland supports this reform financially; The Lego Foundation contributes to the development of Ukrainian primary school.

As for higher education it is actively supported with the British Council and the British Embassy, America House, IREX and the US Embassy, Goethe-Institute and the Germany Embassy. For the last five years the most crucial in the sphere of teacher training were two projects implemented by British Council and Goethe-Institute.

Goethe-Institute project "Deutsch Lehren Lernen" [26] presents a series of continuing programme of learning based on innovative didactic approach of action research and corresponds to the world quality standards of teacher training. The project system comprises the integration of methodology of language teaching and foreign language learning as two inseparable components of a future teacher's professional competence.

"Deutsch Lehren Lernen" suggests the tasks on systematic observation and reflection on pedagogical activity by means of German language video-lessons from three continents. As the follow-up activities, the students can participate in one-week on-line course moderated by mentors. On accomplishing the course the students are to do the planning and elaborate their own action research project.

The project activity is based on blended learning and combines traditional language learning with digital learning, i.e. doing on-line tasks, new words and patterns revision and use, virtual collaboration with group-mates, virtual class learning, Adobe Connect webinars for both students and teachers with the system of completed tasks monitoring.

There are such effective learning tools as Page Player-App, E-book, introductory on-line test (Einstufungstest online), media-pack, help-test (Testhelf), application for the work with vocabulary (Vokabeltrainer – App), supplementary on-line materials, bilingual glossary. The advantage of the project course is obvious as it promotes and motivates students' learning and helps teachers to deliver their teaching taking into consideration all challenges of modern education and information and communication technologies development.

The project "New Generation School Teacher" [27] was initiated by British Council Ukraine and the Ministry of Education and Science of Ukraine in 2013. It aimed at introducing change to the initial teacher education system in Ukraine. The project resulted with the PRESETT curriculum in Methodology and the network of Ukrainian universities implementing it and proving its effectiveness. The project outcomes were presented with such learning ones as:

- student-teachers' and newly-qualified teachers' English proficiency is improved;
- their classroom skills and confidence are enhanced;
- their digital and social media skills are developed.

On the level of action outcomes the newly-qualified teachers:

- teach more effectively and confidently;
- engage with colleagues;
- join networks and meet colleagues overseas;
- can integrate ICT in/outside the classroom;
- are committed to CPD.

As it can be seen the ICT skills were paid special attention and there was designed a separate unit of the new Methodology course "ICT in Learning and Teaching". Its objectives are to form the students' awareness of the advantages and disadvantages of doing activities on a computer and other electronic devices as opposed to similar paper-based activities; the criteria for evaluating and selecting online resources for language teaching purposes; and to develop their skills to use different software (e.g. Microsoft Word, PowerPoint) for language learning and teaching purposes; make use of social networking sites, blogs, wikis, etc. in language teaching; evaluate the potential of online audio and video for language teaching purposes; assess possible risks of using the Internet with young learners and develop a set of rules for cyber safety; explore current trends in mobile learning and be able to use mobile phones for teaching and learning reference.

The whole project represents the large-scale research which comprised 8 university at its beginning, and 13 universities and colleges within the period of its piloting. Our small-scale research was based in its results but was elaborated on the content prepared and piloted in Bogdan Khmelnitsky Melitopol State Pedagogical University only.

Besides of "New Generation School Teacher" project results we used the experience of our participation in the joint project of International Research and Exchanges Board, Academy of Ukrainian Press and Ministry of Education and Science of Ukraine "Learn to Discern: Info-Media Literacy" as its realisation is concerned around integrating info-media focused modules or courses into pre-service teacher training syllabus. In spite of the fact that the project is mostly oriented at the training of teachers of Ukrainian Language and Literature, History and Arts, we have implemented its element in our courses for future teachers of foreign languages.

The amended and modernised curricula of Methodology of Foreign Language Teaching and The First Foreign Language develop teacher profile specialty-based competences as well as critical thinking skills, implement interactive methods of learning and teaching, dialogue modes of interaction, and the ample use of online tools.

While identifying the issue for doing our action research we studied the experience presented in scientific-methodological resources and found out the challenges and opportunities for our learning and teaching context.

The role of information and communication technologies in higher education has been being studied since the very beginning of their appearance and application in this branch. The issue has its diachronic and space aspects, i.e. in different periods we observe the studies of various technologies and the context of national systems of education, types of educational institutions, technical and financial capability, and other numerous factors have an impact on the ICT use and their role.

It is obviously that the ICT use in higher education provides for both personal professional development and the world's information-digital-literate society. Modern education should be available for all people always and everywhere. That is why "life-long learning has become the driving force to sustain in the contemporary competitive environment. Therefore to strengthen and / or advance this knowledge-driven growth, new technologies, skills and capabilities are needed" [28].

The first overview of the issue helped with the starting point of our research and finding the relevant area. Still we had to specify the narrow aspects for elaborating and implementing. This was a cause for doing the survey. Our respondents were university students and school teachers.

The questions asked were about their attitude to the use of ICT in class, their confidence in this practice, and their skills in handling with cyber well-being, websites and learning platforms choice, online resources use, social networking, blogs, wikis application, flipped teaching, proper use of various devices such as mobile phones, tablets, laptops, interactive whiteboards. There were 200 students and 30 teachers who took part in the survey.

In 10 months we repeated the survey of the same students and teachers. There were the crucial differences in educational environment between two surveys as the pandemic influenced greatly the role of ICT in classroom when each university teacher and student faced the challenge of completely distance education. In our case, one more factor made its impact on learning and teaching – it was participation in two projects "Learn to Discern: Information and Media Literacy" (continuing) and "Teaching Excellence Programme" by British Council, Advance HE, Institute of Higher Education NAES of Ukraine in partnership with Ministry of Education and Science of Ukraine and National Agency for Higher Education Quality Assurance in Ukraine (started in May, 2020), and participation in the Training for Teachers by Progresylni (August, 2020).

The project "Learn to Discern: Information and Media Literacy" contributed to the development of skills to work with information by means of various online tools and resources. The team of teachers and students of Bogdan Khmelnitsky Melitopol State Pedagogical University won the grant for the creation of the Hub of Infomedia-Literate Citizens. The team consisted of people who took part in both surveys and they surely demonstrated new results. Due to involving at least 300 people improved their handling with information online and Zoom platform for education and communication.

Application for participation in Teaching Excellence Programme was based on creation of Hub for Teaching Excellence Development. It has been created in 2020 and several workshops for university teachers were delivered. Two of them were devoted to the use of ICT for student-centred education. Sharing the experience of participation in the Programme was of great value for the development of digital and ICT literacy skills of both teachers and students. The trainers from Advance Education (Great Britain) Kathy Wright and Caroline Brennan combined such issues as influences on learning, conceptions of learning, learning theories, outcomes led teaching, planning for learning, making teaching interactive, principles of assessment, types of assessment, giving and receiving feedback, reflective practice, action research, interdisciplinary and other issues with the advanced use of various modern technologies, resources and tools (Edmodo, Socrative, Thinglink, ClassDojo, Storybird, Animoto, Kahoot!, Scretch, Quizlet, Trello, Edpuzzle, Jamboard, TurnItIn, Canva, Schoology, AnswerGarden, Nearpod, Flipgrid and many others).

Besides of demonstrating and explaining all those technologies and resources, the trainers used the loop input, involving participants into activities realised by means of all those tools. Most of them were multifunctional and catered for achieving several educational purposes, while some of them helped to create rapport and demonstrated good sense of trainers' humour. Such simple use of Zoom as filters turned the trainer into a master, then deer and later on helped to create holiday frame. All those workshops-webinars made participants discover numerous ICT uses for education promotion under any circumstances.

The first survey allowed us to see the so-called "digital divide" as only two of teachers (6.7%) answered that they are completely confident as for ICT use in classroom. Completely confident

students were 49%. Though, the questions about cyber well-being, websites and learning platforms choice, blogs and wikis application, understanding of flipped teaching demonstrated that there were some gaps in their information literacy and digital safety skills.

For teachers who took part in our survey we prepared a series of workshops to help them in ICT application in foreign language classrooms.

For students, on the basis of our baseline study we elaborated the unit "Information and Communication Technology (ICT) in Learning and Teaching English" [29] which was based on blended learning and included the following items:

- Modern learning technologies and their relevance for the educational process.
- Cyber well-being: keeping children safe on the Internet.
- Selecting and evaluating websites for teaching and learning purposes.
- The use of learning platforms (e.g. Moodle) for teaching purposes.
- Using online audio and video resources for language learning and teaching purposes.
- Exploration of opportunities offered by social networking sites, blogs, wikis to language learning and teaching.
- The notion of a 'flipped' classroom and its benefits; traditional vs. flipped teaching.
- The main uses of IWBs (interactive whiteboards). and their benefits as opposed to traditional whiteboards.
- Exploration of opportunities offered by mobile devices (e.g. smartphone) in language learning.
- The use of different software and online tools for teaching and learning purposes.
- Power Point making rules.
- Effective ways of information search, finding the primary sources. Accumulating and generalising the information.
- The notions of copyright and plagiarism. Following the copyright. How to avoid plagiarism.
- Teacher's skills in photo, logo, symbols, posters, emoticons, memes, infographics use.

There were no traditional lectures within delivering this unit. The main modes of interaction were presented with games, jigsaw learning, buzz groups, socratic technique, role play, workshop, simulation, cross-over groups, guided reading, lecturette, brainstorming, speaking corners and others. Of all methodology units this one was of the greatest interest for students and positively influenced their motivation to learning. It was confirmed at each session which ended with taking students' feedback.

Each session began with studying the experience on the topic of it. Starting where the students are helped us to choose between possible variables and contributed to making the unit content and methodology of its deliverance more flexible.

Here there are some examples of organising the learning within the unit. In the session devoted to cyber-well-being, after getting acquainted with its principles, watching several videos and brainstorming all ideas about safe use of the Internet, the students make a list of rules for communicating in the world web. They work in groups and find the examples to each rule from the Internet. Each group creates a document on a Google Drive and then works with

all lists created by other groups. They add other suggestions or comment on other groups' products. After discussing the rules of netiquette, one student takes a responsibility to make an accumulated netiquette code and shares it with all students.

One more example of work in teams is presented with evaluating the sites. Before doing this evaluation, the students learn the following criteria essence:

1. Audience
2. Credibility
3. Accuracy
4. Objectivity
5. Coverage
6. Currency
7. Aesthetic or visual appeal
8. Navigation
9. Accessibility

After that their teams work with different educational websites and evaluate the possibilities for their use in the narrow context, i.e. they are informed on the age of learners and their level of English.

When one team presents their findings the representatives of other ones ask questions and give comments. The activity is summarised with formulating tips for the work with websites.

The work with online courses was a little more time-consuming for students as they had to begin some courses (according to their learning interests) on various learning platforms such as https://futurelearn.com or https://openlearning.com. After diving into their courses and getting access to all platform tools, students analysed the content management, curriculum mapping and planning, ways of communication and management of the platform. On the stage of discussing the platforms the students are asked to reflect on their possible moderating such courses, strengths and weaknesses of them.

The use of social networks in learning and teaching arouse the most interest of students. This topic was studied with simultaneous revision of keeping children safe on the Internet. The students suggested the ways of possible algorithms of social media use for educational purposes. This way of ICT use was studied in micro-teaching as students prepared 1-2 activities for their group-mates playing the roles of school students. Through the prepared activities a student-teacher taught English or German to his/her school students. After each microteaching there was a feedback session aimed at finding positive features and methodological mistakes so that avoid them in real classroom.

Especially valuable for students was the work with wikis and blogs as they promote online writing which is rather important for teachers-philologists. In this case we asked students to create their own blogs. They worked in small groups and had one task per a group. To make use of the task they created the blogs of newly-qualified teachers so that they could use them while having their school experience (practice).

All above-mentioned examples were used in methodology class, though sometimes we applied activities of the same typology in our language classes. We give just one example of a task in the class where German is taught as the second foreign language.

So, the students got a set of QR-codes with the help of which they had to find the endings of the statements beginnings of which were given. Then they had to match parts of statements according to the logic approach

In practical language classes especially often were used mobile phones applications as they helped to work with vocabulary and grammar (visualising, training, revision, test control), listening. Writing skills were monitored on the level of messaging. Still for larger pieces of writing we used standard e-mail writing which helped students to learn to write various types of letters. Before writing such letters they searched the information necessary for that very kind of a letter.

While gathering data on our action research we looked for wider evidence of the unit effectiveness. That is why the same survey was conducted for the second time. It confirmed that most of students (87%) began to feel more confident as for ICT use in class. Besides, they were acquainted with a wide range of software, online tools, applications and other methodologically valuable ICT items. While speaking about students completely confident with ICT we discovered 67%. There were still a lot of students quite confident with the use of Instagram or TikTok and very unaware of how to use digital opportunities in their future professional activity.

The ICT use in learning and teaching unit was a very dynamic and useful for future teachers. Its importance and relevance was confirmed by students and teachers. It is the call of the time to make the classroom blended and to transfer a part of learning to virtual reality which so important for "digital native" school students. Besides, modern university students are ready to implement the ICT innovations.

The students had a good opportunity to train in using ICT in hands-on activities when they had their school experience (practice). So, their reflective journals they wrote while practice contained the same feedback as in the end of each methodology session: the ICT is a powerful methodological tool and the factor which favours learning and teaching stay effective.

After the third survey we discovered that the situation changed to the better as 6 teachers grew confident with ICT use in classroom (20%). They explained that fact with the need for vast ICT application during the pandemic and the direct dependence of their teaching on technological decisions. Participation in project events and workshops stimulated their progress as well.

The students stated their progress as well. The number of completely confident students grew up to 75%. The most frequent explanation for the progress was the same as the teachers' one – the emerging need for ICT use as the only way for their learning. Students shared their new experience as "up-scaling their digital worldview".

The comparative analysis of the contents of Ukrainian and American educational programmes demonstrated that the American ones give the students much better possibilities for the development of digital and ICT literacy skills, including both for their future teaching foreign languages and more advanced use. However, among Ukrainian programmes there were several under our consideration which proved to be rather progressive in this direction. They were the programmes of Ternopil, Uman and Melitopol universities. These three programmes were greatly influenced with participation in the project "New Generation School Teacher", so the educational components for digital and ICT literacy skills of future teachers of foreign languages appeared to be well represented. While having such positive experience of specific professional training there is the need for implementing some educational components aimed at advanced ICT use.

The application of ICT in both teacher training and those teachers' future professional activity can be considered unlimited as the technology is rapidly developing and changing the world around us as well as the educational opportunities. Virtual reality contains the enormous potential for improving the quality of learning and teaching foreign languages. This issue have been studied Symonenko et al. [30] who emphasized that "the practice of immersion into virtual environment in foreign language learning will enable students to feel themselves an integral part of the professionally oriented situation which is designed specifically to prepare the course participants for communication within" [30]. Researchers point that virtual reality tasks help students to get used to "psychological challenges and apply existing speaking skills in a foreign language", "encourage spontaneity" and increases students' motivation to "achieve better results in a training course" [30]. Virtual reality is especially valuable for teaching languages in the conditions of natural language speech environment. Besides of demonstrating "situational models of possible daily life circumstances for foreign language communication" [30], virtual reality based tasks surely promote the development of future teachers' information literacy and digital skills.

4. Conclusions

This paper has presented the results of an action research project and a comparative analysis of American and Ukrainian educational programmes for future foreign language teachers, focusing on their digital and ICT literacy skills development. The main findings and implications of the paper are as follows:

1. The action research project demonstrated the importance and effectiveness of developing future foreign language teachers' information literacy and digital safety skills during their pre-service teacher training process. The project involved the design and implementation of a unit based on the courses of Methodology of foreign language teaching and Practical course of foreign language, which aimed to enhance the participants' awareness and skills in various aspects of ICT use in language teaching and learning, such as evaluating and selecting online resources and tools, creating and communicating digital content, assessing potential risks and ensuring cyber safety, and using various electronic devices for pedagogical purposes. The project also involved three surveys of students and teachers, which showed that the participants improved their digital and ICT literacy skills as a result of the project interventions, as well as due to the increased use of ICT in the pandemic situation.
2. The comparative analysis of American and Ukrainian educational programmes revealed that the American programmes offer more opportunities and flexibility for future foreign language teachers to develop their digital and ICT literacy skills in relation to their specific professional activity and needs. The analysis also identified some positive practices and projects in Ukrainian universities that contribute to the innovation and quality of higher education, such as the participation in international projects, the implementation of Teaching Excellence Programme, and the integration of information and media literacy components. However, the analysis also indicated that there is still room for improvement and revision of the Ukrainian educational programmes, especially in terms of adding

more components and courses that aim to develop advanced digital and ICT literacy skills for future foreign language teachers.

3. The paper contributes to the existing literature and practice on digital and ICT literacy skills development for future foreign language teachers by providing a novel action research approach and a cross-cultural perspective on this topic. The paper also addresses a timely and relevant issue in the context of the pandemic situation, which has posed new challenges and opportunities for education in general, and for foreign language teaching in particular. The paper offers some recommendations for further research and practice in this area, such as exploring more effective ways of producing digital content, handling virtual reality, fostering intercultural communication, and ensuring inclusive and equitable quality education through ICT.

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