

Leveraging cloud technologies to create an effective educational environment for developing soft skills in future primary school teachers

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Abstract

The article considers the possibilities of using cloud technologies to create an effective educational environment aimed at the development of future primary school teachers' soft skills. The experience of using cloud technologies is demonstrated, the advantages, challenges and possible limitations of their use are revealed. Prospects for further development of the topic are determined. The main aspects of the article include: clarification of the essence of the concept of "educational environment" and signs of a quality educational environment; review of the potential of cloud technologies for the development of future primary school teachers' soft skills; characteristics of the SAMR model, which describes the levels of technology integration in the educational process; systematized data on types of activities, their impact on the development of certain soft skills of future primary school teachers and applied cloud technologies with practical implementation examples. The obtained research results are emphasized the potential of cloud technologies in creating an effective educational environment aimed at the development of soft skills of future primary school teachers. The conclusions of the article can be served as a basis for further research and the development of programs and strategies aimed at the effective use of cloud technologies in the educational process.

Keywords

soft skills, educational environment, cloud technologies, future primary school teachers, SAMR model

1. Introduction

The need to develop soft skills of future primary school teachers is determined by the growing importance of soft skills in modern society [1, 2]. In particular, the World Economic Forum's 2023 Future of Jobs Report 2023 emphasizes the need for the development of soft skills in connection with changes in the field of work and rapid technological development. According to the report by the World Economic Forum, 44% of workers' skills will be lost in the next five years. Therefore, six out of 10 workers will need training by 2027 [3]. Therefore, the criteria for quality training of future primary school teachers will include matching the skills of a graduate of a higher education institution to the requirements of the labour field and the need to undergo on-the-job training after graduating from a higher education institution.

Taking into account the above, the training of future primary school teachers requires the creation of an effective educational environment [4, 5] that will contribute to the development of education seekers' soft skills, in particular, the Top-10 Skills published by the World Economic Forum in 2023. Among which are cognitive skills such as creative and analytical thinking; three self-efficacy skills – curiosity and lifelong learning, motivation and self-awareness, resilience, flexibility, and agility; technological literacy; reliability and attention to detail; two skills for working with others – empathy and active listening, leadership and social influence; quality control [3].

The importance of the development of soft skills in the future primary school teachers is evidenced by the results of an electronic search from the outlined direction in the Google Scholar search system

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and the ERIC database over the past five years. A combination of such words as: “the development of soft skills” and “future primary school teachers” was chosen as keywords for research selection.

In Google Scholar, the search was carried out for words in Ukrainian and English, in the ERIC database – in English. In Google Scholar, the total number of search results in both languages in which one of the keywords occurs is 17,965 (in Ukrainian – 965, in English – 17,000). Both keywords – 294 (in Ukrainian – 65, in English – 229); in the ERIC database – 8761 search results for publications in which one of the keywords occurs, both keywords occur in 110 publications. The relevancy of all queries was determined, and a subset representing 10% of the results in Google Scholar and ERIC was selected. By reading the titles and abstracts, the selection of publications for detailed analysis was continued.

In a number of studies, the importance of the development of “soft skills” of future primary school teachers is emphasized, which is substantiated by education reforms [6, 7]. The following are identified as necessary soft skills for successful professional activity: communication skills, critical thinking, creativity, emotional intelligence, flexibility of mind [6]; basic, communicative, social, thinking skills, self-control, self-assessment [7]; communicative, social, positive self-concept, mental activity, self-control [8]; teamwork, communication skills, critical thinking, ability to solve problems [9]; accountability, communication, innovation, problem-solving, teamwork, professional working, and networking skills [10]; lifelong learning skills, verbal and non-verbal communication skills [11].

Kasim et al. [10] proposed to form the soft skills of undergraduate students using the learning by teaching technique, considering it as an alternative learning technique, in which the development of soft skills becomes the goal of learning.

The focus of this research is to examine the ways in which new technologies can be integrated into reflective English for Specific Purposes (ESP) teaching methods [12] to stimulate student motivation and encourage the development of the aforementioned skills which are not only professional, but also metacognitive in nature, within the context of first year non-specialist English language students in Communication Studies [11].

The effectiveness of the integration of traditional and innovative teaching methods for the development of “soft skills” of future primary school teachers is revealed in the study [6]. In particular, attention is focused on encouraging students to reflectively evaluate their emotions, speech technique, behaviour in the course of gaining practical experience and self-study [6].

Technologies for the development of “soft skills” in future teachers include, along with traditional pedagogical technologies, the following: project activities, problem-based learning, and the creation of a subject-development environment [13].

The study by Haran et al. [8] is also mentioned the integration of traditional and innovative technologies during distance learning, which contribute to the development of “soft skills” of student youth. It is noted that the use of information technologies in distance learning allows the teacher to use a variety of innovative technologies, which contributes to the development of “soft skills” of student youth [8].

The feasibility of using cloud technologies in the educational process of higher education institutions is recognized today at various levels, including international organizations and normative documents that set standards in the field of education [14].

UNESCO identifies the use of information and communication technologies as one of the main strategies for the development of modern education, including the use of cloud technologies to improve access to education, collaboration, and knowledge sharing [15].

Strategic documents of the European Commission, such as “Digital Education Action Plan (2021-2027)” [16] and “European Commission digital strategy” [17] are emphasized the feasibility and importance of integrating cloud technologies into the educational process to improve accessibility, efficiency, and innovation. These documents are provided guidance and strategic support for the development and implementation of digital solutions in the field of education using cloud technologies.

The European Union supports initiatives aimed at the use of cloud technologies in the field of education. The “Horizon Europe” program [18] defines the development of digital infrastructures and platforms, in particular cloud services, as one of the priority areas of funding.

Ukraine has declared the use of cloud technologies as one of the priorities for the development of education in the context of the digital transformation of education. The project of the Concept of

Digital Transformation of Education and Science for the period until 2026 is envisaged the use of cloud technologies in education to create an infrastructure of cloud services in order to ensure access to educational materials and create a digital educational environment [19].

These normative provisions are indicated that the use of cloud technologies in the training of future specialists has strategic importance and is considered as an effective means of improving the quality of education, promoting collaboration and providing access to various educational resources.

Interest in the problem of using cloud technologies in education is also followed by scientific events devoted to this problem, in particular within the framework of the peer-reviewed annual international computer science conference ICTERI [20] and annual CTE seminar on cloud technologies in education [21].

The problem of using cloud technologies for the development of individual soft skills of students of higher education is not new in modern educational practice. In particular, such aspects as:

- development of creative abilities of students as a component of the process of forming soft skills with the help of remote technologies [22, 23]. It is determined that for the formation of the creative abilities during distant learning it is advisable to use systems of education's management, to use cloud-technologies, systems of videoconferences' organization, messengers [24, 25, 26];
- develop cloud resources to support chemistry education and the formation of soft skills in the field of group work skills [27, 28, 29];
- using of cloud technologies for the formation and development of critical thinking in future lawyers [30];
- research on the effectiveness of the use of cloud technologies by teachers in education using the CTES tool [31], etc.

Therefore, the uniqueness of our scientific work is in the application of cloud technologies not as a means for the formation of individual or complex soft skills of higher education seekers, but as a means that allows creating an effective educational environment for the development of soft skills of future primary school teachers.

The purpose of the article is to investigate the possibilities of cloud technologies for creating an effective educational environment aimed at the development of soft skills of future primary school teachers; consider practical examples of the implementation of cloud technologies in the educational process of higher education applicants; identify the benefits, challenges and possible limitations of their use.

To conduct this research, aimed at solving the problem of creating an effective educational environment for the development of future primary school teachers' soft skills by means of cloud technologies, the method of exploratory research was chosen. This approach was made it possible to carry out the systematic analysis and generalization of the available scientific literature and, on this basis, to determine the relevance of scientific research, to reveal the definitions and essence of its main concepts and the theoretical basis of the research, which became the basis for the development of didactic materials for the creation of an educational environment aimed at the development of soft skills of future teachers primary classes using cloud technologies. The special emphasis in the work was made on the description of the experience of using cloud technologies in the preparation of future primary school teachers to create an effective educational environment aimed at the development of their soft skills. The analysis of which made it possible to highlight the advantages and disadvantages of their application, and, as a result, to define a prospective research plan.

2. Application of cloud technologies to create an effective educational environment for the development of soft skills of future primary school teachers

The development of future primary school teachers' soft skills is considered as an end-to-end process, which is carried out when studying various educational components of educational and professional

training programs for future primary school teachers at both the first (bachelor's) and second (master's) levels.

2.1. Definition and essence of “educational environment” concept

The definition and essence of the concept of “educational environment” is widely researched in scientific and pedagogical literature [32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43]. Petrenko [44] analyses and compares different definitions of the term “educational environment”. She defines that the concept of “educational environment” means the natural or artificially created environment of the participants of the educational process in the space of education, which includes the content and means of education aimed at ensuring the productive creative activity of the individual, his educational development, pedagogical conditions, situations, the system of relations between people united by common pedagogical and educational activities. In addition, the work revealed that the educational environment has qualitative characteristics, its own environmental factors, and a multi-level structure with vertical interrelationships between levels [44].

Loboda [45] examines the concepts of substantiation of the “educational environment” phenomenon by modern scientists, focusing on approaches to the interpretation of the educational environment, such as ecological-personal approach, communicatively oriented approach, anthropological-psychological approach, eco-psychological approach. The author notes that a wide range of approaches to defining the essence of the concept of “educational environment” has been formed in modern pedagogical science, this is due to the complexity and multifaceted nature of this phenomenon. Loboda [45] makes similar generalizations as the previous researcher, notes that the educational environment is understood as both the natural and artificially created sociocultural environment of a person, which contains content, various learning and education' means, which ensure the process of personality development through the creation of favourable for this condition.

So, in the context of our research, we define the concept of “educational environment” as a complex set of conditions, resources, tools, and practices that contribute to the learning and development of students of higher education.

2.2. Signs of the effective educational environment

The direction of our scientific search is determined by the creation of an effective educational environment for the development of future primary school teachers' soft skills. Therefore, the next steps are related to the definition of the signs of an effective educational environment.

Studying the problem of the quality of the educational environment, we turned to the research of Kosenko [46], which is presented recommendations on approaches to assessing the quality of the educational space:

1. To clearly distinguish approaches to the assessment of the quality of the educational space in the system of internal and external quality assurance of the institution's educational activities.
2. Self-assessment of the quality of the educational space. In the institution, firstly, attention should be paid to the factors that ensure safe and harmless conditions of stay of students and teachers.
3. Functional suitability of premises and site.
4. Availability of the necessary amount of furniture and equipment, compliance of the arrangement of premises and areas of the territory according to the purpose and anthropometric features of the users. This recommendation is directly related to the previous one.
5. Consideration of psychological and pedagogical factors. D. Kosenko notes that there are few clear criteria in this field, therefore the task of the internal quality assurance system is to accumulate and discuss, evaluate, systematize and generalize experience, on the basis of which conclusions are drawn and to look for opportunities to implement the necessary changes.
6. Aesthetic aspect.

In the considered work [46], attention is focused on the educational space. Obviously, educational environment and educational space are closely related concepts that describe the conditions, context, and resources used to implement the educational process. However, they have some differences in their perception and coverage. Educational environment is a broader concept which is covered all aspects that affect the learning and development of students. Educational environment is included: the physical environment (educational premises, furniture, equipment), social environment (interaction with teachers, classmates, and other higher education students), organizational aspects (educational and training programs, methods and approaches), as well as access to resources and technologies. As mentioned above, the educational environment is created in order to promote learning, skill development, stimulation of creativity and independence of education seekers.

Analysing the concept of “educational space”, we see that it, to a greater extent, is focused on the physical and virtual space where learning takes place. Examples of educational space are educational institutions, classrooms, libraries, laboratories, virtual platforms and other places where students of higher education interact with teachers, classmates, other students of education. The educational space includes physical and digital infrastructure that supports the educational process and facilitates accessibility and interaction.

Thus, the educational environment is a broader concept that is encompassed all aspects that affect the learning and development of learners, including the educational space. An educational space is a specific physical or virtual environment where learning, interaction and communication take place.

The connection between the educational environment and the educational space is that the creation of an effective educational environment is involved taking into account and organizing the physical and virtual space, which is contributed to the learning and development of students of higher education. The educational environment is defined the general principles, values, approaches to learning, while the educational space is concretized these principles and turns them into concrete physical and virtual means.

To determine the signs of the effectiveness of the educational environment for the development of future primary school teachers’ soft skills, we focus on general principles, approaches to the education of future primary school teachers, as well as the Top-10 Skills published by the World Economic Forum in 2023. In view of the above, the effectiveness of the educational environment will be determined by several features.

The first feature is characterized the focus of the educational environment on stimulating learning and development of higher education seekers. This means that it should be promoted the active involvement of students in the educational process, created comfortable conditions for acquiring knowledge and developing skills.

The second feature is that the effective educational environment should be been conducive to cooperation and interaction. It should support opportunities for collective and group work, exchange of ideas and experiences between students and teachers. Such opportunities can be provided with the help of joint work areas, project tasks, group discussions, use of common digital platforms and other collaboration tools.

Another sign of the effective educational environment is the provision of an individual approach to students of higher education. It should be contributed to understanding and, taking into account the needs and interests of each student, stimulate their self-development and independence. This can be provided through individual assignments, personalized learning programs, and a variety of materials and resources.

An effective educational environment has to be technologically oriented. The use of cloud technologies is one means of achieving this. They provide opportunities to access learning resources from any device and from any location, collaborate and share knowledge in real time. This increases the accessibility of learning, expands opportunities for collaboration and promotes innovation in education.

Therefore, an effective educational environment is characterized by such features as:

- stimulation of conditions for training and development of higher education seekers;

- favourable conditions for cooperation and interaction, both between students of higher education and with teachers;
- individual approach to students of higher education;
- using modern technologies, including cloud technologies.

2.3. Possibilities of cloud technologies for the development of soft skills of future primary school teachers

In our practical activities for the training of future primary school teachers, we have identified a number of possibilities of cloud technologies to create an effective educational environment aimed at the development of their soft skills.

Firstly, it is access to advanced educational content. With the help of cloud technologies, students of higher education are given the opportunity to access a variety of educational materials, including video lessons, interactive exercises, e-textbooks, and more. This is allowed to enrich the educational process and make it more exciting and accessible.

Secondly, it is joint work and exchange of knowledge. Cloud technologies allow learners and teachers to collaborate, exchange ideas and knowledge in real time and remotely. They can work on joint projects, comment on and improve each other's work, and discuss and analyse learning material.

Thirdly, it is online communication and collaboration. Cloud technologies provide the opportunity to interact in real time through video conferencing, chats and forums. This promotes active communication between students and teachers, joint solving of tasks, discussion of problems and communication outside the classroom.

Fourthly, is personalized training. Cloud technologies are allowed to customize the educational process according to the needs of each student. With the help of individual progress tracking systems, teachers are able to provide a personalized approach to learning. Cloud technologies are made it possible to adapt materials, tasks, and resources according to the individual needs and level of knowledge of each student. Using analytics and collected data helps educators understand the needs of higher education students and provide them with appropriate support and assistance.

Fifthly, it is independent learning and development. Students of higher education are given the opportunity to access various educational resources, electronic libraries, online courses and tools for independent acquisition of new skills and deepening of knowledge. They are able to set their own pace of learning, explore issues that interest them, and develop their soft skills such as self-organization, self-discipline, and self-management etc.

Sixthly, it is mobility and flexibility. With the help of cloud technologies, the educational environment is become mobile and flexible. Students can access learning content and resources from any device, anytime, anywhere. This allows them to learn at their own pace, conveniently organize their time and adapt to personal needs and circumstances.

2.4. The SAMR model

The SAMR model (Substitution, Augmentation, Modification, Redefinition) is the conceptual model that describes the levels of technology integration in the educational process. This model was developed by Puentedura [47] in 2010 and provides educators with tools to evaluate and understand how effectively they are using technology in teaching.

The SAMR model includes four levels:

1. *Substitution*. Technology is acted as a direct tool substitute, with no functionality [47]. The substitution strategy is saved time and space, and reduced time-consuming tasks with pen and paper [48]. The example of a substitution could be: using an electronic text instead of a paper one, or uploading a sheet in PDF format for student access, as opposed to photocopying; encourage students to print their work instead of writing by hand; using online tests and programs instead of pen and paper; using a digital interactive whiteboard as opposed to a traditional whiteboard

and saving the results as a document [48]. Replacement is created favourable conditions for a soft transition to the development of technological skills, compared to modification and transformation. It is provided an opportunity for higher education students to familiarize themselves with new technologies before they are begun to transform students learning [48].

2. *Augmentation*. Technology is acted as a direct tool substitute, with functional improvement [47]. In the augmentation phase, technology is added something to the learning process beyond convenience, which can make a complex topic clearer or more exciting than traditional methods [48]. Examples of addition: using a translator to translate words from a foreign language; conducting more informative and interesting oral presentations, which are supported by accompanying multimedia presentation, created using, for example, PowerPoint, Prezi, etc.; using the Internet for independent research on the topic; the instructions are supplemented with videos that explain a particularly difficult concept to understand [48]. Supplementation is allowed for independent and student-centered learning, and the use of technology as a source of information encourages active learning that does not require constant teacher guidance [48].
3. *Modification*. Technology is allowed for significant task redesign [?]. At this level, technology is allowed changing tasks and provides new opportunities that were previously unavailable without the use of technology. At the modification stage, technology is used to develop interactive and dynamic tasks that are gone beyond the traditional classroom. For example, students can collaborate on joint documents or work in large groups, which ensures seamless collaboration and sharing of knowledge and experience. This interaction is based on the principle of “equal-equal”, contributes to the formation of the ability to cooperate and the dynamic culture of the group. Technologically modified assignments allow learners to create inspired and innovative work that is not limited to paper [48]. Examples of modification: creation of a collective web project where students can collaborate and interact; creating a podcast that is a summary of the topic that can be accessed by other higher education students as a resource for review in the future; creating an informative video presentation instead of a standard oral presentation; use of technological tools that are allowed visualizing an abstract concept [48].
4. *Redefinition*. Technology is allowed for the creation of new tasks, previously inconceivable [47]. It changes the very essence of learning and contributes to the expansion of opportunities.

In the transformation stage, technology is used to create completely new opportunities for learning. Transformation is had the potential to connect learning to the real world and produce real results. It equips learners with strong technological skills such as digital collaboration, communication, technological literacy and the ability to adapt to new systems and processes. Most importantly, using technology to reimagine learning in the classroom leads to the emergence of active and interested education seekers who embrace a growth mindset [48].

Examples of transformation: publishing one’s work online, for viewing by peers and the wider community; recording of speeches with a presentation or practising of physical or other skills of education seekers for further analysis and their discussion; experiment with tasks that use large multimodal elements (e.g., creating short videos, a web page, printing documents with creative layouts, etc.) [48].

The SAMR model is promoted the transition from simple replacement of technologies to their modification and transformation in the educational process. It is created opportunities for the development of creative and analytical thinking of students of higher education, promoted involvement in active cooperation and co-creation, and also developed problem-solving skills.

The use of the SAMR model is allowed teachers to effectively introduce technology into the educational process, stimulating the development of students of higher education. It is promoted the active participation of students in education, involvement in various research tasks and projects that contribute to the development of their creative and analytical thinking.

However, the SAMR model is not a strict line of progress. It is reflected in a graduation from simple to complex use of technology, but successful learning also depends on the design of tasks that are performed using technology, as well as on the appropriate guidance and support of the teacher.

The SAMR model is a useful tool for teachers, which is helped to rethink the use of technology in the educational process and can become an assistant in creating an effective educational environment for the development of soft skills of future primary school teachers by means of cloud technologies.

2.5. The experience of using cloud technologies in the training of future primary school teachers to create the effective educational environment for the development of their soft skills

We consider practical examples of the application of cloud technologies to create an effective educational environment for the development of soft skills of future primary school teachers in distance learning conditions. In this case, the educational space was formed by the Moodle educational platform and the Zoom video conference platform. The planning and creation of an educational environment for future primary school teachers, which would be contributed to the development of their soft skills, was carried out with a focus on the identified signs of the effectiveness of the educational environment and the abilities of cloud technologies.

The focus on distance learning is due to the fact that in 2022-2023 in connection with the Russian armed aggression against Ukraine the educational process at Sumy State Pedagogical University named after A. S. Makarenko was taken place exclusively in a distance format. Note that the vast majority of classes in the previous 2021-2022 school year were also held in distance due to the COVID-19 pandemic [49]. However, the proposed options for using cloud technologies can be applied regardless of the form of education, in particular, offline education. Because they are relied on BYOD technology, the large number of the offered cloud technologies can be implemented using the mobile devices of higher education students directly in the classroom.

The primary task was to find techniques, methods, means, and technologies that would allow creating an effective educational environment for the development of future primary school teachers' soft skills. To solve this problem, they relied on the SAMR model [47, 48] and The Pedagogy Wheel by Carrington [50].

Alan Carrington's Pedagogical Wheel is a model developed by educator Alan Carrington for designing and developing effective instructional design using technology. This model provides a framework for integrating learning objectives, methods, technology, and assessment to achieve the best learning outcomes.

The work carried out on the selection of cloud technologies for the creation of an effective educational environment aimed at the development of future primary school teachers' soft skills was made it possible to systematize data on the types of activities, their impact on the development of certain soft skills of future primary school teachers and applied cloud technologies. The results are presented in Table 1, where a plus sign "+" indicates a purposeful active influence on the development of the relevant skill, a minus sign "-" – the absence of a purposeful influence on the development of the relevant skill.

According to table 1, we consider several examples of the use of cloud technologies in the aspect of the research problem.

Example 1. Determining the emotional state, setting up for effective work

Determining the emotional state and setting up for effective work are important steps in creating a supportive and enabling educational environment. This is allowed the participants of the educational process to feel comfortable, feel supported and motivated, which contributes to their active learning and development of soft skills. Cloud technologies can be used to collect and analyse data on the emotional state of participants in the educational process. For example, with the help of Mentimeter, Padlet, Jamboard applications, it is possible to quickly collect data on the emotional state of students at the beginning of the lesson. This is enabled the teacher to respond in time to the emotional needs of students of higher education and set them up for effective work.

Using the Mentimeter application, we offer such variations of this activity as: "Mood thermometer" – we used the "Multiple Choice" template (see figure 1 (1)); "My mood" – the template "Multiple Choice"

Table 1

Types of activities with corresponding cloud technologies for the development of soft skills of future primary school teachers.

| Activities | Types of soft skills* | | | | | | | | | | Cloud technologies |
|--|-----------------------|---|---|---|---|---|---|---|---|----|--|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Determining the emotional state, setting up for effective work | - | + | - | - | - | + | + | + | + | - | Mentimetr, Padlet, Jamboard, WodlWall, Inter-acty |
| Reflection | - | + | + | - | - | + | + | + | - | + | Mentimetr, Jamboard, Padlet, WodlWall |
| Joint creative work in groups | + | + | + | + | + | + | + | + | + | + | Padlet, Jamboard, Google Docs, Google Slides, Canva |
| Collaborative projects | + | + | + | + | + | + | + | + | + | + | Padlet, Jamboard, Google Docs, Google Slides, Canva |
| Brainstorming, circle of ideas | + | + | + | + | + | + | + | + | + | + | Padlet, Jamboard, Google Docs, Google Slides, Canva |
| Data visualization | + | + | + | - | - | + | + | - | - | + | Canva, Genially, Visme, Venngage, Mindomo |
| Visualization of ideas | + | + | + | - | - | + | + | - | - | + | Canva, Genially, Visme, Venngage, Mindomo |
| Using online services for data searching | + | + | + | - | - | + | + | - | - | + | Google, Google Scholar, Facebook, LinkedIn, eLibrary, eLABa, YouTube |
| Creation of interactive educational materials | + | + | + | - | - | + | + | - | - | + | Canva, Genially, WodlWall, LarningApps, Kahoot, Quizlet, LiveWorksheets, Wizer.Me, WordArt |
| Content creation | + | + | + | - | - | + | + | - | - | + | Canva, Genially, Visme, Screenity |

* *Conditional marks:* 1 – creative thinking; 2 – analytical thinking; 3 – curiosity and lifelong learning; 4 – stability; 5 – flexibility and dexterity; 6 – technological literacy; 7 – reliability and attention to details; 8 – empathy and active listening; 9 – leadership and social influence; 10 – quality control.

was used (figure 1 (2)); “I feel myself” used the “Pin on Image” template (figure 1 (3)) and “I am at the beginning of the lesson” – used the “Scales” template (figure 1 (4)).

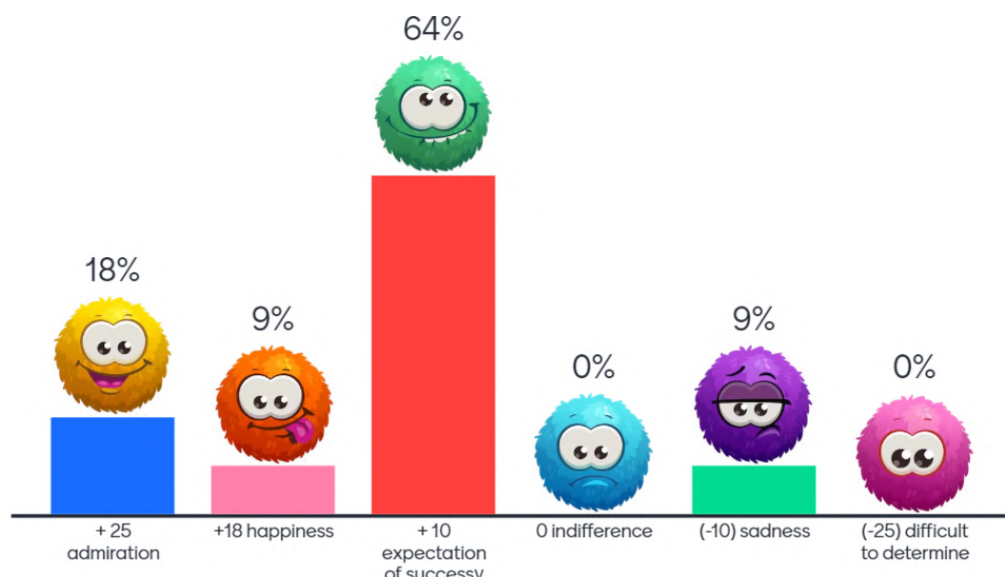
In the Mentimeter application, we create a questionnaire using one of the above templates. For higher education applicants, we provide a link and a QR code to access the questionnaire. In the first two cases (“Mood thermometer” and “My mood”), we invite students to look at the presented options of emotions and choose one of them that corresponds to their state here and now. When using the questionnaire “How I feel myself”, we invite higher education’s students to look at the pictures and put a mark on the one of them that best corresponds to their condition. After all higher education applicants have made their choice, we analyse the results. Be sure to focus on the fact that you should not be ashamed to express your emotions. Each person can feel both good and bad, that our condition is not something permanent and not changeable. Be sure to discuss with students’ what resources they use to improve their mood. We gradually form in them an understanding that if training takes place in a friendly and joyful atmosphere, it will be effective, and we also focus attention on the fact that training itself should also be joyful.

The questionnaire “I’m at the beginning of the class” is based on the Scales template, consists of two scales – my mood and readiness for the class, each participant has to put a mark on them: where 1 is very bad, and 5 is very good. The group’s summarized results are displayed on a slide for further analysis and discussion.

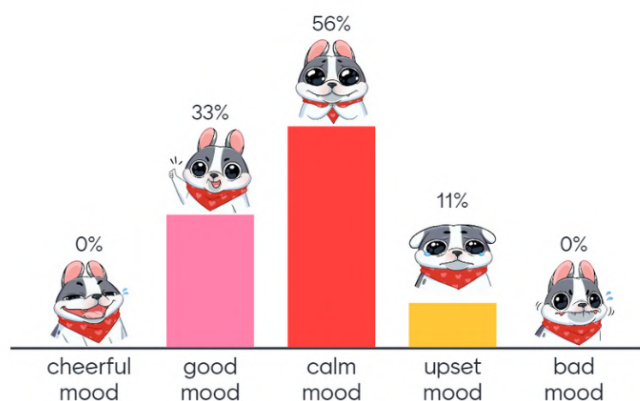
The tasks developed in the Mentimeter application to determine the emotional state of higher education students according to the SAMR model are an example of modification, since they cannot be carried out without using the application.

Another tool used to determine the emotional state of students was the online board Padlet. The Mood Screen task variants created belong to the Substitution level, as they are substitutes for the Mood Screen material variants.

Access to the board was provided through a link and a QR code. Two versions of the task were used: 1) they were suggested looking at the emoticons and choosing the one that most closely matches the



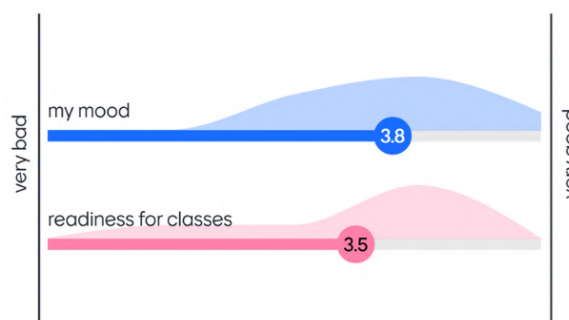
(1)



(2)



(3)



(4)

Figure 1: Examples of questionnaires for determining the emotional state of higher education applicants developed in the Mentimeter application.

student’s mood at that moment and marking it as a favourite (figure 2 (1)) they were recommended to look at the emoticons and writing their last name under the emoticon that best matches the mood of

the student at that moment (figure 2 (2)).



(1)



(2)

Figure 2: Some variations of the “Mood Screen” created in the Padlet application.

The Jamboard online board was used by analogy with the Padlet online board to create a “Mood Screen”. It also was served as a substitute for the physical version of the mood screen. Access to the board was provided through a link and a QR code. Students of higher education were offered to look at the presented variants of cactus emotions and choose the one that best matches the mood of the student at that moment and move it up (figure 3). At the end, the results must be analyzed and discussed.

The experience of using the Mentimeter, Padlet, and Jamboard applications to determine the emotional state of higher education applicants is showed that they are quickly allowed to cope with the specified task. The Mentimeter app is allowed to get the fastest result and taken the least time to complete the task, but Padlet and Jamboard are allowed to see not only the overall result, but also the results of individual participants.

Example 2. Reflection

Reflection is important in the process of developing soft skills of future primary school teachers. It is a process of introspection in which students of higher education examine in detail their thoughts,



Figure 3: “Mood screens” which is created in relation to Jamboard.

emotions, actions, and interactions with others. In the context of soft skills development, reflection is allowed future elementary school teachers to consciously evaluate their skills and understand how they affect their professional development and interaction with other participants in the educational process.

The capabilities of the Mentimeter application made it possible to develop a task for conducting a quick reflection. Based on the “Traffic Lights” question template, the “Microphone” task was created (figure 4 (1)). The “Multiple Choice” template (figure 4 (2)) was used to construct a task in which one should choose one of the statements regarding the overall assessment of the lesson and the level of understanding of the material. The “Scales” template (figure 4(3)) made it possible to reflect on several parameters: assessment of one’s activity, assessment of the teacher’s activity, assessment of content, assessment of forms and methods of interaction. Each parameter was evaluated by students of higher education on a scale from 0 to 5: where 0 – did not like it, and 5 – liked everything. The generalized results of the group were displayed on a slide, which made it possible to analyse and discuss them.

If we analyse the tasks from the perspective of the SAMR model, then the first two reflection tasks are examples of Augmentation, since such reflection options can be carried out using traditional means, but the use of the Mentimeter application makes them more exciting. But the third option belongs to the level of Modification, since it is not possible to carry out such a task using traditional means.

The experience of reflection using cloud technologies is showed such positive changes as:

1. Development of self-awareness of future primary school teachers. Reflection is allowed each student of higher education to realize their strengths and weaknesses, which stimulates them to actively work on their professional growth.
2. Personality development. Reflection is contributed to the personal development of students of higher education, helped to expand their horizons, understood other points of view, developed empathy and tolerance.
3. Improvement of skills. Reflective activity is allowed future primary school teachers to analyse their work, identify strengths and weaknesses, and find ways to improve. This contributes to the continuous improvement of professional skills of higher education students.
4. Supporting professional growth, as reflection, is a key element in the professional growth of future primary school teachers. It is helped to identify areas in which can be improved soft skills and inspired to: improve learning approaches, find new methods and use innovations in the

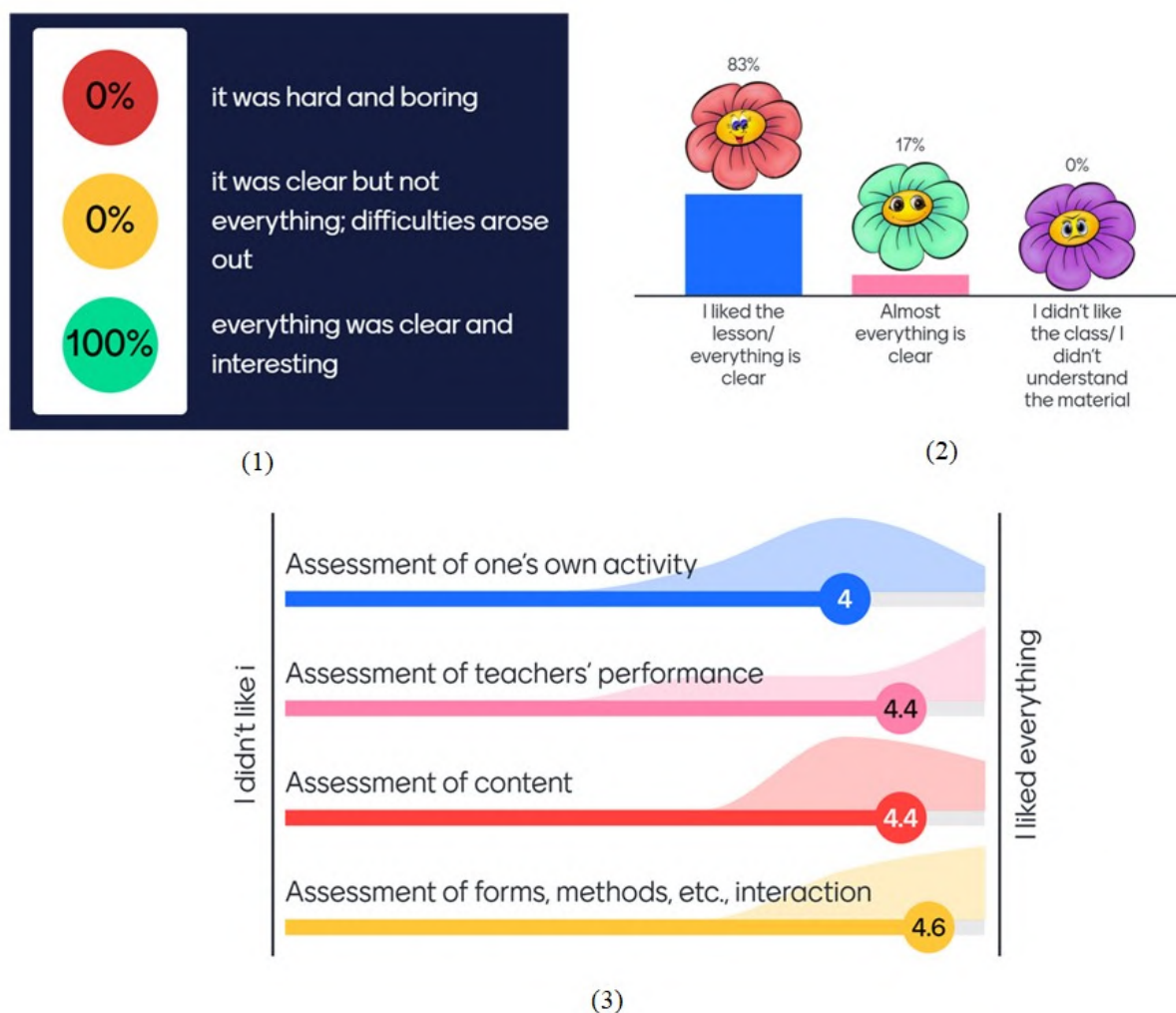


Figure 4: Some examples of reflection tasks created using the Mentimeter application.

educational process.

Example 3. Collaborative projects

Collaborative projects are a form of joint work where participants combine their knowledge, skills, and resources to achieve a common goal. In such projects, students of higher education work together, collaborate, exchange ideas, interact and contribute to the process of creative work.

One of the variants of the collaborative project was work on creating a road map of the lesson.

At the beginning, students of higher education were united in teams of 3 people. Each of the teams received the task:

1. Work out fragments of textbook pages and “enliven the page”, that is, develop a fragment of a lesson based on this textbook, using an activity approach.
2. Record the developed fragment of the lesson with the help of a road map. Each team has 30 minutes to create a road map.
3. Place the created road map on the Padlet board (see figure 5).
4. To reflect using a framework for analysing the process of interaction between an adult and a child.

In this case, the Padlet board (figure 5) was played several functions: as a board on which tasks were placed, as well as electronic fragments of textbook pages; as a board for presenting work results; as a



Figure 5: The fragment of the Padlet online board while working on a joint project to create a lesson roadmap.

means of passing reflection. From the point of view of the SAMR model, this option of using the Padlet is corresponded to the Modification level of the SAMR model.

Each team used the Jamboard online board to create a roadmap, justifying their choice by the convenience of collaborative work.

The experience of involving students of higher education in collaborative projects proves that their use contributes to the development of soft skills of future primary school teachers at several levels:

1. **Communication.** Collaborative projects are stimulated communication between participants, which contributes to the development of listening skills, expressing one's thoughts, interaction, and cooperation. Participants learn to clearly and clearly express their ideas and opinions, take into account the opinions of others, and find a common solution.
2. **Work in a team.** Collaborative projects are required joint work and interaction of participants. Participants learn to cooperate effectively, delegate tasks, follow a work schedule and resolve conflict situations. It is promoted the development of teamwork skills, leadership, and an understanding of the roles and contributions of each member.
3. **Analytical and creative thinking.** Collaborative projects are often involved in solving complex tasks or problems. Participants learn to analyse the situation, generate ideas, search for solutions and evaluate their effectiveness. This contributes to the development of analytical and creative thinking, a creative approach to solving issues and the ability to work with uncertainty.
4. **Planning and organization.** Collaborative projects are required in goal definition, resource allocation, action planning, and task control. Participants learn to plan their time, manage tasks and achieve their goals.

Example 4. Visualization of ideas

Visualization of ideas is the process of transforming abstract concepts, thoughts, ideas, or data into visual forms that is allowed better understanding, representation and communication of these ideas. To

visualize ideas, it can be used the variety of tools such as charts, graphs, diagrams, maps, illustrations, and other visual aids to convey information in a clear and accessible way.

Visualization of ideas helps to represent complex concepts, relationships, interactions, and information in the form of graphic images, making it easier to understand and remember. Visualization is also helped improve communication and collaboration because it allows you to visually share ideas and interact with other people.

An interesting option for the visualization of ideas is to work on the task of creating a “Flower-card” – five spheres of child development.

The students of higher education were offered, after familiarizing themselves with the content of the question about the areas of child development, tasks of the following nature:

- Create a “flower-card” with five petals, on which to record keywords that ordain reveal the meaning of each area of the child’s development.
- In the centre of the “flower”, write down a phrase that unites all these areas and is directly related to the purpose of primary education.
- Take a photo/take a screenshot of the “flower-card” and add it to the Padlet board.

To create “Flowers-cards” (figure 6), students of higher education used such applications as Genially (figure 6 (1)), Canva (figure 6 (2)), Visme (figure 6 (3)). In this case, the technologies are corresponded to the Modification level of the SAMR model.

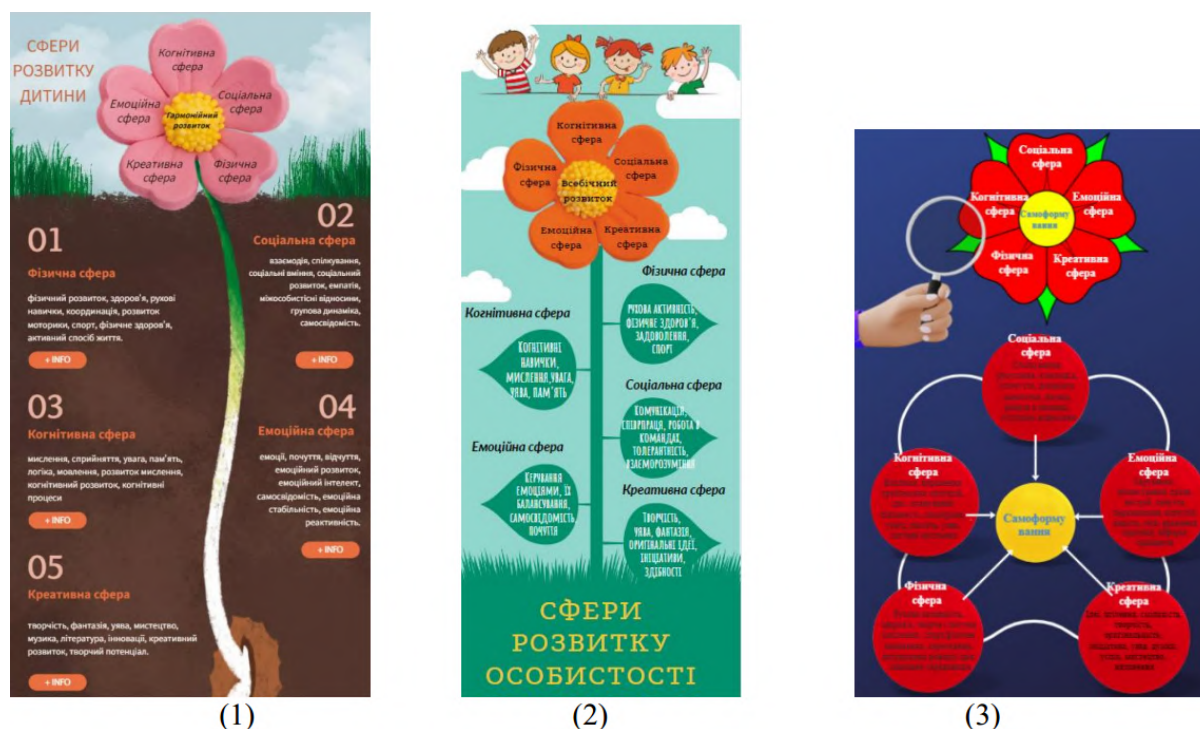


Figure 6: Some examples of performance of the task “Flowers-cards” by students of higher education.

In the context of soft skills development, visualization of ideas is helped to develop skills such as creative thinking, communication, collaboration and analytical thinking. It stimulates the creative process, helps enrich ideas, develop strategies and find innovative solutions. Visualization of ideas can be used in educational, work and creative processes to improve communication, solving of problem, project development and ensure effective collaboration.

2.6. Advantages, challenges and possible limitations of using cloud technologies

The experience of using cloud technologies to create an effective educational environment aimed at the development of future primary school teachers’ soft skills allows us to highlight the following

advantages of their use:

1. **Availability.** Cloud technologies are provided access to tools and resources from any device with an Internet connection, allowing higher education students to use them anywhere, anytime.
2. **Cooperation and communication.** Cloud technologies are provided tools for collaboration and communication that promote communication skills, collaboration, and effective teamwork.
3. **Flexibility and adaptability.** The use of cloud technologies is allowed future primary school teachers to adapt to changing needs and situations, use a variety of tools and resources to develop various soft skills.
4. **Data storage.** Cloud technologies are provided convenient storage and backup of data, which is allowed to save important information and progress in the development of soft skills without the risk of loss.

However, their use has a number of challenges and limitations:

Firstly, it is the computer literacy of all participants in the educational process, since the use of cloud technologies requires users to have basic computer literacy and skills in working with digital tools. Therefore, maybe, someone needs training and education to use these technologies effectively.

Secondly, it is the dependence on the Internet. It is obvious that the use of cloud technologies is required constant access to the Internet, the lack of connection can be created obstacles to work and collaboration, especially in conditions of limited Internet coverage or low-quality connection.

Thirdly, it is privacy and security. Storing data in cloud services can be raised questions about the confidentiality and security of information. Be careful and use reliable services with proper security measures to protect your data.

Fourthly – technical problems, such as system failures, unavailability of services, etc. This can be affected in the continuity of the work and change the attitude of the interaction participants towards the activity.

Fifthly, it is cost. Although many cloud services have free plans, full functionality and additional features may require paid subscriptions or advanced plans. Financial aspects and budget must be taken into account when using cloud technologies.

3. Conclusions

The study of the possibilities of cloud technologies for creating the effective educational environment aimed at the development of future primary school teachers' soft skills, the consideration of practical examples of the introduction of these technologies into the educational process of higher education applicants, as well as the identification of advantages, challenges and possible limitations is showed the potential of cloud technologies in the field of development soft skills of future primary school teachers.

On the basis of the conducted research, we see further development of the topic from the following perspective plans:

1. Expanding the analysis of modern publications on the research problem, for a more thorough study of it.
2. Selection of tools for evaluating the validity of made didactic materials for creating an effective educational environment aimed at developing soft skills of future primary school teachers.
3. Conducting the experimental study to assess the impact of the use of cloud technologies on the creation of an effective educational environment was aimed at the development of soft skills of future primary school teachers. This is allowed obtaining concrete data and conclusions about the effectiveness of these technologies in the context of education.
4. Development of instructions and educational materials that ordain contribute to the successful implementation of cloud technologies to create an effective educational environment is taken for the development of soft skills of future primary school teachers. Convenient and accessible instructions and educational materials help students of higher education master these technologies and use them effectively in their practice.

5. The development of specialized platforms and resources that ordain combine materials, tools, and examples of the use of cloud technologies for the development of future primary school teachers' soft skills, help ensure the availability and ease of use of these resources.
6. Cooperation with other educational institutions and experts in the field of education to create a platform for the exchange of ideas, transfer of best practices and joint development of innovative approaches to the use of cloud technologies for the development of future primary school teachers' soft skills.

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