Developing professional stability of future socionomic specialists using cloud technologies in blended learning

Hanna B. Varina[1], Kateryna P. Osadcha[1,2], Svetlana V. Shevchenko[1] and Valentyna V. Voloshyna[3]

[1]Bogdan Khmelnitsky Melitopol State Pedagogical University, 59 Naukovoho mistechka Str., Zaporizhzhia, 69000, Ukraine
[2]Norwegian University of Science and Technology, Høgskoleringen 1, 7034 Trondheim, Norway
[3]Dragomanov Ukrainian State University, 9 Pyrohova Str., Kyiv, 01601, Ukraine

Abstract

This article explores how cloud technologies can be used to develop the professional stability of future socionomic specialists in blended learning environments. Professional stability is a key factor for the competitiveness and adaptability of graduates in the labor market. The article focuses on the use of cloud services, such as Google Workspace for Education and Moodle, to enhance the ICT competence and the mental capacity of the students. The article also identifies the psychological and pedagogical conditions and the didactic capabilities of cloud services for developing the cognitive, motivational, behavioral, emotional and volitional components of professional stability. The article presents a methodological framework for designing the process of professional stability development based on cloud services. The article reports the results of an empirical study that assessed the level of development of professional stability components and related abilities, such as empathy, emotional self-regulation, vitality, among students in blended learning. The study found significant positive changes in the indicators of professional stability after the implementation of the cloud-based program. The article suggests further research directions for developing a comprehensive program for using cloud technologies in non-formal education and personalizing the process of professional development of future specialists.

Keywords

cloud technologies, blended learning, professional stability, socionomic specialists, higher education

1. Introduction

Higher education is undergoing a transformation, as it adapts to the open and dynamic educational system of the European Union. To achieve this, higher education institutions need to adopt the latest methods that rely on information technologies, and meet the diverse needs, abilities and interests of the learners. The rapid development of information technologies and the challenges posed by the COVID-19 pandemic [1, 2, 3] have increased the demand for

personalized and individualized education, as well as for competitive and professionally stable specialists [4]. Information technologies are present in all aspects of pedagogical activity, from teaching specific disciplines to managing higher education institutions.

Cloud technologies are one of the most prominent and innovative information technologies that are increasingly used in various sectors, including education [5, 6, 7, 8, 9]. Cloud technologies offer many benefits, such as scalability, flexibility, cost-effectiveness, and accessibility. According to recent statistics, about 77% of companies have already adopted or plan to adopt cloud technologies, and 69% of them consider it a necessary condition for survival in a competitive and changing world. The cloud industry is also constantly evolving and introducing new features and applications. The year 2020 has been marked as "the year of cloud technology" by the international press, as it witnessed a massive shift to cloud-based solutions due to the coronavirus crisis [10, 11]. Major cloud providers, such as IBM, Amazon and Microsoft, have expanded their cloud services not only in the United States, which is the main country of data hosting, but also in other countries.

Cloud technologies are one of the key factors for improving the quality, individualization and personalization of higher education. They enable the interaction of multiple remote systems that support the learning process, as well as their mobility and cost-effectiveness. Cloud computing provides data resources to end users as an Internet service [12]. The Development of Digital Economy and Society of Ukraine Concept outlines the need for implementing incentives for the digitalization of the economy, public and social sectors. It also addresses the challenges of raising awareness, using tools for digital infrastructure development, and developing digital competence. This Concept also defines the critical areas, identifies the digitization projects, and plans to stimulate the domestic market of production, use and consumption of digital technologies. It emphasizes that the integration of Ukrainian science into the European research space will facilitate the development of advanced scientific ideas, participation in interdisciplinary projects, and focus on promising ideas, technologies and innovations.

One of the important tasks is to formulate a comprehensive national policy of digitalization of education as a priority component of educational reform, and as a key element of the Digital Single Market of Europe and a part of the paradigm "Open Innovation – Open Science – Openness to the World", which is evolving within the European scientific innovation space. There is also a need to develop a European cloud of open science and a European data infrastructure. The implementation of the main postulates of the Concept has been underway for some time, and various scientific research works in this direction have been conducted in Ukraine [13].

The dynamic changes in modern Ukrainian society create a socio-cultural and educational situation that requires enhancing the quality and professionalism of future specialists who can adapt and self-actualize in unstable and changing work conditions. Future professionals need to be aware of the connection between their personal characteristics and the requirements of their profession, and to construct their own personality within the framework of professionalization, which creates conditions for becoming a professional. The issue of students' social mobility, readiness for self-education in the new information field, where integration competence plays an important role, is also urgent for modern Ukrainian student youth. The issue of professional stability is also relevant, as it is a practical aspect of a broader problem – the problem of competitiveness, efficiency and readiness for professional self-actualization in today's uncertain conditions of professional activity. Therefore, it is also very important to find optimal ways to

provide educational services that take into account the individual psychological characteristics of future specialists and the innovative trends of using cloud technologies in their training process.

2. Literature review

The issue of creating cloud services is very popular in today's world, where the priority is a rapid development of information technologies and their use in public spheres. Many analytical companies study the development market, build cloud services and implement them into practice. The main purpose of professional training is to develop such a potential of a specialist, which would ensure not only the quality of his professional duties, but also professional self-improvement. In the conditions of transformation of a society the problem of adaptation of future experts to fast changes both in social and economic, and in cultural and educational spheres of life acquires special sense. Today's dynamic, competitive society requires the training of a new type of professionals, namely those who could be creative, unconventional in decision-making, be mobile and effectively carry out professional activities. Forrester Research has assessed the current dynamics of cloud storage popularization and concluded that by 2020 the cloud computing market will be $ 241 billion [14].

In the world's developed countries, the technology of cloud computing is becoming more and more widespread. In the domestic market, they are also actively penetrating public infrastructure.

Infrastructure as a service (IaaS) is a model of providing on-demand remote access to a common pool of configurable computing resources (cloud infrastructure) with the ability to manage them independently.

The foundations for the creating and rapid development of cloud technologies were:

- technical progress, rapid development of hardware: the ever-increasing power of processors, development of multi-core architecture and increase of the hard disk storage capacity;
- high power Internet channels;
- "large" Internet services, cloud data storage;
- impact of quarantine conditions caused by COVID-19, combined with the need to perform certain activities.

Cloud storage is a model of online storage in which data is stored on numerous networked servers which are provided to customers mostly by a third party. Data is stored and processed in the cloud, which is, from the client's point of view, one large virtual server. It should be noted that the cloud is not the Internet itself, but the whole set of hardware and software that provides processing and execution of customer's requests. There are not many authoritative sources that define the concept of cloud computing. The most comprehensive and fundamental approach to this issue was proposed by Mell and Grance [15]: they define cloud computing as a model of providing convenient on-demand network access to a shared set of parameters, computing resources (e.g., networks, servers, data storages, applications and/or services) which the user can quickly use, when executing their own task, and free up while minimizing the number of

interactions with the service provider or their own management efforts. This model is aimed at the increase of the availability of computing resources and combines five main features, three service models and four deployment models.

Characteristics of cloud computing:

1. Self-service on demand. The consumer, when he or she needs it, can use computing capabilities, such as server time or automatic network storage, without interaction with the staff of the service provider.

2. Wide availability via the network (Internet). Opportunities are available online; they are accessed on the basis of standard mechanisms; it ensures the use of heterogeneous thin and thick client platforms (e.g., mobile phones, laptops, PDAs).

3. Combining the resources into a pool. The provider combines its computing resources into a pool in order to serve a large number of customers using the principle of multitenancy. Different physical and virtual resources are dynamically distributed and redistributed according to the user's needs. There appears a sense of location independence when the customer does not know where the computing resources they use are, but may be able to identify their location on a more abstract level (e.g. country, region or data center). Examples of resources can be data storage, computing power, RAM, bandwidth, virtual machines.

4. Ability for quick adaptation. Computing capabilities can be quickly and flexibly reserved (often automatically) for prompt scaling according to the customer's tasks, and also quickly vacated. From the consumer's point of view, the available options often look unlimited and can be purchased in any quantity and at any time.

5. Measurable service. Cloud systems automatically control and optimize resource utilization by measuring some abstract parameters. The parameters vary depending on the type of service. For example, they may be: data storage size, computation power, bandwidth and/or number of active user's records. Resource use is tracked, controlled; reports are generated. Thus, both the provider and the consumer receive transparent information about the range of services provided (consumed).

Cloud technologies represent a new paradigm that provides a distributed and remote processing, data storage; they lead us to a new concept of using Internet resources in today's educational environment.

The analysis of modern scientific research works has shown that there exists the experience of using cloud platforms and virtualization technologies, including those based on the virtual machines from Microsoft, Amazon, Google, for the organization of universal workplaces for students with unification of system and application software for individual learning. Shevchuk et al. [16] studied the main advantages of cloud software over traditional academic tools used in the educational environment. The authors paid attention to the organization of a virtual workplace in order to increase the effectiveness of learning both in the educational institution and outside the classroom.

Analyzing the possibilities of using cloud technologies as a component of future specialists' professional training, taking into account personal psychological characteristics, Kolesnyk et al. [17] demonstrated a structural model of information and media literacy of university entrants

and the use of cloud technologies in the education for sustainable development. Kolesnyk et al. [17] analyze the levels of formation of such type of entrants' literacy in the process of their sustainable development (cognitive, constructive-exploratory, creative and productive levels). Kolesnyk et al. [17] developed a method of interaction of information and media literacy with cloud technologies in the educational process.

Osadcha et al. [18] research the current state and relevance of the use of adaptive learning systems and cloud technologies as useful tools for the development of an individual learning path leading to the highest level of intellectual development in accordance with natural abilities and inclinations. Taking into account the technological progress and the actualization of STEM education, the priority is the research work done by the Valko et al. [19], they focused on a detailed description of the introduction of cloud sources in the development of robotic systems.

Analyzing the combination of traditional classroom education and distance learning, Petrenko et al. [20] focused on the possibilities of using cloud technologies in the process of organizing distance learning and the implementation of a comprehensive competency-oriented approach.

The practice-oriented research of the staff of the research laboratory "Cloud Technologies in Education" of Kryvyi Rih National University and the Institute of Information Technologies and Textbooks of NAES of Ukraine demonstrates ways to implement models of cloud services SaaS, PaaS, IaaS, which should be used in the process of doing the courses on mathematical, natural cycles while organizing future specialists' professional-practical training in the field of information technology (on the example of software engineering, computer science and computer engineering). Scientists have identified the most significant advantages of using cloud technologies in future specialists' training in information technology, namely the possibility of using modern parallel programming tools as the basis of cloud technologies [21]. Thus, cloud technology is not only a modern trend of effective use of information and communication technologies in professional activities, but also a proven tool of educational activities [22].

Analysis of literature sources has shown that the issue of development and implementation of cloud services in the process of training of competitive future professionals is an important area and it requires additional practice-oriented empirical research in order to expand the possibilities of creating cloud technologies and to implement them successfully not only in the sphere of education but also in other no less important areas of human activity.

3. Research methods

Interdisciplinary research was conducted as part of research work carried out at the expense of the general fund of the state budget: "Adaptive system for individualization and personalization of future professionals' training in the conditions of blended learning", state registration number: 0120U101970. Taking into account the pandemic conditions and social isolation, from 2019 to 2020 on the basis of Bogdan Khmelnitsky Melitopol State Pedagogical University in the context of the program "Development of professional stability of the future specialist in the conditions of information and educational transformations" the implementation of the psycho-correctional program, based on the elements of cloud technologies, was proposed. The following methods were used in the research process: method of theoretical analysis of literature sources on the introduction of cloud technologies in the educational process of higher educational institution
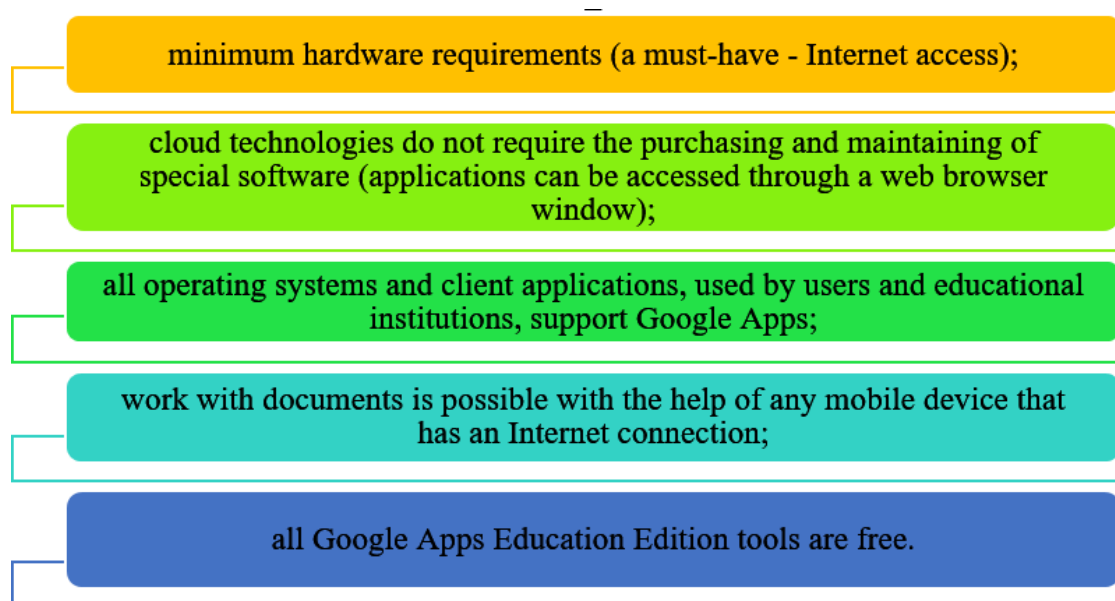
and on the implementation of distance learning based on the principles of adaptive and personalized learning; analysis of modern experience of psychological and pedagogical support of integrative process of future specialist's professional stability development; systematization of practical experience of enhancing the person's working capacity in higher educational institution; analysis of the practical implementation of Google Workspace for Education in the program of the future specialist's professional stability development; a set of psychodiagnostic examinations using Google Forms; experimental study consisting of two stages: ascertaining and formative.

4. Research results

4.1. Theoretical foundations

Modern information and educational environment of the university is analyzed in the context of the electronic display of various aspects of the university activity on the Internet. There are different plans for designing the e-learning environment that take into account the interests of different groups of network users. From the socio-psychological standpoint, the electronic educational environment of the university takes an active part in the improvement of educational technologies, emergence of new aspects of teaching activity, and creation of the conditions of students' self-realization.

Example of modern cloud-based services for educational institutions is Google Workspace for Education. Google's online services for educational institutions have a number of advantages, which makes it possible to use them in any educational environment where there is an Internet connection (figure 1).

minimum hardware requirements (a must-have - Internet access);

cloud technologies do not require the purchasing and maintaining of special software (applications can be accessed through a web browser window);

all operating systems and client applications, used by users and educational institutions, support Google Apps;

work with documents is possible with the help of any mobile device that has an Internet connection;

all Google Apps Education Edition tools are free.

Figure 1: Main features of Google Workspace for Education use in education from the user's point of view.

Modern computer technology allows students, teachers and researchers to use several devices for the communication and work: laptops, computers, smart phones, mobile phones, etc. Google Workspace tools are supported by a variety of devices, so it is a widely available and universal IT technology to work with in the modern educational environment. Google Workspace include more than sixty free services that can be connected to one domain, including video hosting service YouTube, CMS Blogger, Google Analytics, organization chart service Lucid Chart, graphic editor Aviary, etc. They are easy to use, are serviced by Google and do not require downloading, installing or maintaining hardware or software. In addition to its diversity, which meets any needs of the modern teacher, Google applications have such characteristics as accessibility, simplicity, reliability, low cost, stability, variability, quality. The additional arguments in favor of choosing Google services and other services for the educational purposes are the availability of special applications for phones and tablets, centralized data storage, information security and Ukrainian interface. Google Workspace for Education combines a number of useful services, such as:

- Gmail – a free e-mail service;
- Classroom – assistance of learning;
- Drive – file hosting using cloud technologies;
- Calendar – time planning;
- Vault – archiving and management of user's data;
- Docs – a set of tools for working with office files;
- Sheets – processing of data presented in the form of spreadsheets;
- Forms – creating online forms and conducting surveys;
- Slides – creating presentations, regardless of the available device;
- Sites – a platform for hosting and a designer for creating sites;
- Meet – interactive communication and video conferencing tool.

The above mentioned services can be used both separately and in combination, as a complement to each other [23].

Today, one of the most well-known and widely used services for organizing learning of students is Google Classroom (https://classroom.google.com). Its use allows you to organize effective interaction of all participants of the educational process, distribute educational materials and provide the execution of various educational tasks with necessary software, assessment of students' learning outcomes. Google Classroom provides a user-friendly interface for creating and managing training courses. It gives a wide range of opportunities for the organization of the educational process in higher educational institutions. The service has all necessary facilities for the communication, task setting and testing. Also, the use of Google Classroom helps to increase learning motivation; saves time for the preparation; provides clear and interactive information, so it contributes to better assimilation of information. The use of Google Classroom in the process of future professionals' training systematizes the work of all participants of the educational process and takes it to a higher level.

Taking into account the dominant advantages of using Google Classroom in the organization and monitoring of the educational process in the university and certain quarantine restrictions

due to COVID-19 [24, 25], the priority in the context of our study was given to the development, testing and implementation of a comprehensive program "Development of professional stability as a factor of future specialist's psychological security in terms of information and educational transformations". This program was being piloted during 2019–2020 as part of the scientific and practical online course "Modern innovative technologies in education and psychology" [26]. The purpose of this online course is a practice-oriented implementation of the competence-based approach in the process of training future specialists in socionomy. It also aimed at the improvement of future educators and psychologists' professional skills and competencies in order to create better opportunities for the use of modern practice-oriented technologies in the educational process. This online course consists of four modules and is based on the use of Google Classroom. It is 90 hour, 3 ECTS credit online course which includes four modules:

Module 1. Worldview foundations of professional development of specialists of socionomic professions
Content lines:

1. Information part. State strategy of education development. Legislative support of the system of education and professional development of teachers in Ukraine. A healthy and safe environment of an educational institution as a component of professional well-being and development.
2. Practice-oriented part. Value and activity principles of teacher and psychologist's professional development. Specialist's speech competence. Information and media literacy as a key competence of a digitalized society and the main condition for quality education.
3. The part is aimed at developing the professional stability of the individual. Implementation of practical tasks and group training exercises on "Professional resilience as a means of overcoming complex professional tasks and life situations". The main directions of the introduction of innovative psychotechnologies:
   - Styles of overcoming behavior in the decision-making process under conditions of uncertainty while performing professional tasks;
   - Resource components of personality and their development;
   - Social environment as a resource for the development of professional stability. Team building and corporate ethics of interpersonal interaction.

Module 2. Development of modern specialist's psychological and pedagogical competence.
Content lines:

1. Information part. Fundamentals of inclusive education, children with special educational needs: peculiarities of learning and development, psychological and pedagogical conditions for their assistance in the educational process, universal design in education. Establishment of the safe educational environment, prevention of bullying and its overcoming in the educational institution, modern problems of adaptation and socialization of the students; formation of students' social competencies in the process of neuromanagement. Pedagogy of partnership: interaction with teachers, parents, local authorities, and community. Psychological support of talented children.

2. Practice-oriented part. Development of specialists' emotional competence. Specialists' psychological competencies: psychological features of the child's development at different age stages, strategies and tactics of professional and personal burnout prevention, psychology of team building; psychodiagnostics of student's personality, psychodiagnostics of educational management.
3. The part is aimed at developing the professional stability of the individual. In this block, group lessons were implemented aimed at developing the emotional component of professional stability and goal-setting skills:
   - Professional stability and psychological well-being as determinants of the competitiveness of a future specialist;
   - Professional stability as an alternative to learned helplessness;
   - The art of setting and achieving professional goals;
   - Personal formula for professional success

Module 3. Organizational and methodological principles of the development of specialist's professional competencies.
Content lines:
1. Information part. Practical psychologist's educational and preventive work in the educational institution. Counseling as a method of psychological influence. The use of art-therapeutic techniques in the educational process. Conflict prevention and resolution using renewable techniques. Functioning of psychological service in the system of education in the conditions of the New Ukrainian school: legislative base.
2. Practice-oriented part. Development of a practical psychologist's digital competence:
   - protection of personal data on the Internet, safe use of digital technologies and services; legal and ethical requirements for the use of information and communication and digital technologies in professional activities;
   - cloud services in the professional activity of a specialist; streamlining digital educational resources, ensuring accessibility, organizing the interaction of participants in the educational process;
   - use, creation, design and distribution of digital educational resources;
   - use of distance learning technologies; virtual class: an overview of the resources for creating a virtual class; creation and organization of the educational process;
   - preparation of a distance course: selection of a platform for webinars, educational process planning, preparation of a scenario for a webinar; providing interactive distance interaction of participants in the educational process;
   - specialist's digital portfolio; working with documents; creating and compiling a portfolio using a site (blog).
3. The part is aimed at developing the professional stability of the individual. In this block, a personality-oriented approach is implemented in the process of updating the creative potential of future specialists. Students researched and used the mechanism of creativity for the development of resource components of professional sustainability. The following group training sessions were held:

- Creative creativity as a resource for development professional stability;
- Professional and personal potential as the foundation of creative creation.

To achieve an effective result, students are familiar with the "Quest of resilience" methodology to prevent the devaluation of their own achievements in the process of solving practical professional problems.

Module 4. Introduction of innovative technologies into various spheres of psychological and pedagogical activity.

The subject of study – modern practice-oriented technologies and methods of psychological assistance of individuals and groups. The purpose – acquaintance with and internalization of innovative practice-oriented technologies in practical psychologist's activity.

Content lines:

1. Information part. Innovative technologies for working with children with special educational needs. Development of interhemispheric interaction by the method of kinesiology. Innovative coaching technologies in a modern specialist's activities. Innovative art-therapeutic technologies in various spheres of public practice. Case-study technology in a modern specialist's educational work. Supervision in psychological practice: modern realities.

2. Practice-oriented part. Within this block, future specialists developed, implemented and analyzed the effectiveness of the developed training program, focused on solving current social problems. Based on the results of the implementation, students wrote down in online format a qualitative and quantitative analysis of the effectiveness of the implementation of a personal training program.

3. The part is aimed at developing the professional stability of the individual. In this block of the module, group lessons are implemented, focused on the development of the general level of individual resilience:

   - Development of communication skills as an element of "involvement" (according to S. Maddy);
   - Development of teamwork skills, conflict-free communication skills as an element of "involvement" (according to S. Maddy);
   - Development of skills of confident behavior as an element of "involvement" (according to S. Maddy);
   - Development of skills of stress-resistant behavior as an element of "control" (according to S. Maddi);
   - Teaching relaxation skills, self-control emotions as an element of "control" (according to S. Maddy);
   - Development of the ability to set a goal as an element of "control" (according to S. Maddi);
   - Development of self-knowledge as an element of "risk taking" (by S. Maddy);
   - Development of a positive Yconception as an element of "risk taking" (according to S. Maddy)

Due to the practical orientation of this online course, its structure includes a comprehensive training program "Development of professional stability of the future specialist in the conditions of information and educational transformations", which was conducted using Google Classroom cloud technology. In order to provide feedback and stimulate sharing with the participants of the training group, the technical capabilities of Google Meet and the Trapscan application (psychological diary) are used. The application uses one of the main methods of cognitive-behavioral therapy – ABC analysis. The role of thoughts in shaping the mood and well-being of the individual is very significant and it is not the situation that affects what emotions a person feels, but the perception of this situation. The application allows you to keep a diary and analyze personal reactions, work with your thinking, improving the quality of your life. Duration of this training: 18 hours (9 classes of 2 hours each). The duration of each class may slightly vary depending on the degree of participants' interest and the actualization of their problems.

When indentifying the essential characteristics of specialist's professional stability, we took into account the following methodological ideas:

- stability is a qualitative characteristic of any object, system or individual; thus, quality means some certainty of the subject or the individual possessing certain specific features;
- stability is manifested in holistic systems, self-organization of which is impossible without the existence of a hierarchical structure of internal factors;
- stability of the psychologist's personality is formed in the process of self-identification and professional development and is manifested in the work and active self-organization;
- stability is the result of the functioning of mechanisms that actively counteract the negative influencing factors [27].

The developed model of structural components of future specialist's professional stability acts as a theoretical and methodological basis for the development and implementation of this training program (figure 2). As a result of theoretical analysis, we have identified the following components in the structure of the future specialist's professional stability.

Based on the model of development of future specialist's professional stability, as a factor of effective mental capacity of the individual, all structural parts of the training were divided into the following blocks:

- formation of psychological readiness to work in new transformational conditions;
- development of psychological awareness of various aspects of professional activity;
- enhancement of personal efficiency and working capacity;
- development of specialists' personal stress resistance to the growth of mental load and work in the new information conditions;
- formation and development of professionally significant cognitive qualities;
- development and improvement of skills and abilities to establish psychological contact with different categories of citizens;
- formation of skills of role behavior in different situations of professional activity;
- improvement of the ability to apply psychological and pedagogical methods of influence in the complicated conflict situations of communication;

Motivational component	Cognitive component	Connotative component	Reflexive-valuable component	Regulatory-volitional component
COMPONENTS OF THE FUTURE SPECIALIST'S PROFESSIONAL STABILITY				
Motives related to the attitude to the future professional activities	Awareness of the patterns of future professional activity in the field of practical psychology	Skills of organizing and finding a creative solution of problems in future professional activity	Ability for reflection	Volitional regulation of future activities
	Awareness of the principles, directions, technologies of professional activity		Value orientations in future professional activity	Ability for self-regulation
Motives related to the development of professionally significant personal traits	Subject-specific knowledge	Skills and abilities of professionally stable behavior	Readiness for productive communication and establishment of trusting relationships (level of development of communication sphere and empathy)	Volitional regulation at the stage of self-development
Motives of achievement	Knowledge about oneself	Ability to restructure behavior and activities in changing conditions (adaptive capabilities of the individual)		The level of emotional regulation development

Figure 2: Structural components of future practical psychologist's professional stability.

- formation of the ability of psychological stability in tense situations of professional activity;
- development of personality's positive emotional and volitional qualities, training of specialists in self-regulation and self-management;
- formation of volitional activity and skills of volitional actions;

- development of positive internal motivation to carry out effective professional activity;
- preparation for mental overload at work.

The structure of each unit included three elements: 1) acquaintance with the characteristics of a particular trait that was developed, a metaphorical explanation of the content and objectives of the unit, "warming-up" activities; 2) the main part; 3) reflection on the unit as a whole.

The training program was designed and piloted taking into account the following principles: the principle of purposeful creation of emotionally colored situations (active influence on the individual, creation of appropriate conditions for the perception and assimilation of new knowledge that is emotionally colored and has personal significance); the principle of personal developmental communication (understanding, recognition and perception of personality); the principle of using empathy as a psychological mechanism in the education of personality (includes two cognitive components – the ability to distinguish and name the emotions experienced by other people and take another person's position; and the emotional component – the ability to respond emotionally); the principle of systematic analysis of one's own actions and the actions of others (it contributes to the formation of the ability to predict the above mentioned results and has a positive effect on the development of behavioral skills of overcoming instantaneous aspirations, states, desires).

The program is created in accordance with the principles of the Accelerated Learning Theory and implies all the latest advances in the field of methodology of teaching adults.

4.2. Experimental results of research

While conducting a formative experiment based on the piloting of a comprehensive training program "Development of professional stability of the future specialist in the conditions of information and educational transformations" we introduced the practical online course "Modern innovative technologies in education and psychology" in order to identify the effective psychological and pedagogical conditions for the development of professional stability, as a factor the specialist's mental capacity. After conducting the formative experiment we compared the results of two psychodiagnostic assessments. The sample was randomized and consisted of 58 people who did practical online course "Modern innovative technologies in education and psychology" – 30 people, future professionals in psychology, who participated in the training program and 28 people, future professionals, who didn't take part in the training program. The psychodiagnostic unit of the study included a survey using Google Forms.

According to the analyzed structural components of professional stability of the personality in the psychodiagnostic block the following techniques were carried out:

- For successful higher education and maintaining the optimal level of professional stability of students, it is important to have a valuable motivation to study. For this purpose, we used the method of "Motivation to study at university";
- Methodology "Questionnaire to determine the level of socio-psychological stress", aimed at identifying the level of manifestation of socio-psychological stress in future professionals at different stages of professional genesis, which affects the indicators of their overall level of professional stability;

- Methodology "Coping behavior in stressful situations", aimed at identifying the dominant coping stressful behavioral strategies in students. Obtaining these data allows a more thorough study of the psychological conditions for the development of their professional stability, because only a constructive coping response to stress, aimed at rational analysis of the problem and solve a complex stressful situation, allows future professionals to overcome difficulties and successfully solve professional problems without reducing performance.
- "Questionnaire DORS – Differentiated assessment of states of reduced efficiency (fatigue-monotony-oversaturation-stress)", which is aimed at determining the degree of manifestation of each of the physiological states of personality stability (fatigue-monotony-saturation-stress). The development of these states leads not only to a decrease in resistance, but also affects the qualitative characteristics of behavior and emotional coloring of experiences, which provokes significant changes in the motivational sphere of personality.

The analysis of the results of piloting the system of psychological and pedagogical measures showed the significant differences between the control and experimental groups in terms of indicators of professional stability and the development of its psychological and pedagogical conditions. Significant changes in the indicators have been traced according to all the methods used. In order to identify the significance of the changes that occurred after the correction work, we used the G-criterion [28]. The G-criterion is used for the establishment of the general direction of sign shift under research. We put forward the hypotheses:

H_0: The predominance of the typical direction of shift between the obtained data is accidental.

H_1: The predominance of the typical direction of shift between the obtained data is not accidental.

This work contributed to the effective formation of experimental group specialists' value motivation for learning (table 1).

Table 1
Learning motives of the experimental group ($n = 30$) control group ($n = 28$) specialists according to the formative experiment results.

Learning motives	Experimental group		Control group	
	before	after	before	after
Knowledge acquisition	33.36 (10)	36.67(11)	28.57 (8)	28.57 (8)
Mastering the profession	10.00 (3)	26.66 (8)	7.14 (2)	10.71 (3)
Getting the diploma	56.66 (17)	36.67 (11)	64.29 (18)	60.71 (17)

As we can see from table 1, in the experimental group there was an increase by 16.66% in the number of people wishing to master the profession (from 10.00% to 26.66%). It means that they rethought themselves as future professionals; they started demonstrating the desire to develop professionally important qualities, to become an educated person and a high-caliber professional. In addition, the number of people, who are focused on the acquisition of certain professional knowledge, showing curiosity, purposefulness and independence in the process

of knowledge acquisition, has slightly increased (from 33.36% to 36.67%). Due to this, there was a decrease by 20.01% in the number of respondents who considered getting a diploma or professional certification as a priority of learning. That is, it can be stated that after conducting some activities the motivation for learning of the experimental group respondents has become more valuable. Having analyzed the indicators of the control group, we saw only a few changes. There was a shift of only 3.57% in motives of mastering the profession and getting a diploma. Also, according to the results of correlation analysis it was found out: with $n = 108$, typical shift is positive. Negative shifts – 32.

$$G_{contr} = \begin{cases} 45 \ (p \leqslant 0.05) \\ 42 \ (p \leqslant 0.01) \end{cases}$$

G_{emp} – a number of untypical shifts, so $G_{emp} = 32, G_{emp} < G_{contr}$. It means that H_0 is not proved, but H_1 is accepted.

It is also necessary to note significant changes in the manifestations of the level of socio-psychological stress of the experimental group students (table 2).

Table 2
Quantitative indicators (%) of levels of social-psychological stress of experimental ($n = 30$) and control ($n = 28$) groups students after the formative experiment.

Level of social-psychological stress	Experimental group		Control group	
	before	after	before	after
Low level	33.33 (10)	46.67(14)	39.29 (11)	42.86 (12)
Medium level	63.33 (19)	53.33 (16)	57.14 (16)	53.57 (15)
High level	3.34 (1)	0 (0)	2.57 (1)	3.57 (1)

As we can see from table 2, after the introduction of the training program, in the experimental group there was an increase by 13.34% (from 33.33% to 46.67%) in the number of people with a low level of stress and there were no people with a high level of this indicator. Future professionals have stopped perceiving the process of adaptation to the introduction of information, cloud technologies in the educational space as that associated with stress. There was a slight decrease of the medium level of this indicator (from 63.3% to 53.33%), which proves the effectiveness of the development of the experimental group students' personal stress resistance, their ability to tolerate stress. There are only a few changes in the control group. Having used the G-criterion, we found out that the changes were due to the implementation of the correction program, but not thanks to the external artifacts that threaten the internal and external validity of the experiment. With $n = 115$, the typical shift is positive. Negative shifts – 38.

$$G_{contr} = \begin{cases} 45 \ (p \leqslant 0.05) \\ 42 \ (p \leqslant 0.01) \end{cases}$$

G_{emp} – a number of untypical shifts, so $G_{emp} = 38, G_{emp} < G_{contr}$. It means that H_0 is not proved, but H_1 is accepted.

The formation of the effective individual behavioral styles to overcome stressors after conducting experimental activities is confirmed by the following data (table 3).

Table 3
Features of coping reactions to stress in experimental ($n = 30$) and control ($n = 28$) groups according to the results of the formative experiment.

Coping-behaviour in stressful situations	Experimental group		Control group	
	before	after	before	after
Coping oriented for the solution of the problem	23.33 (7)	36.66 (11)	28.57 (11)	32.14 (9)
Coping oriented for the emotions	6.67 (2)	13.34 (4)	7.14 (2)	7.14 (2)
Coping oriented for the avoidance	70.00 (21)	50.00 (15)	64.29 (18)	60.72 (17)

The table 3 shows the increase in the percentage of participants of the experimental group (from 23.33% to 36.66%) who choose coping, focused on solving the problem, and a significant decrease (from 70.00% to 50.00%) in the number of people who prefer to avoid coping in stressful situation. That is, thanks to the work done, future specialists in situations of stress and uncertainty have become more focused on rational analysis of the problem, its constructive solution, they try to create and implement a plan to solve a complex stressful situation, rather than just blindly avoid their problems applying protective mechanisms or compensating for problems as before. In addition, in the experimental group, the number of people, who prefer not to think about problems at all, involving others in their experiences, trying to forget in a dream or compensate for negative emotions with food, decreased by 6.67%. Analyzing the changes in the control group, we can state in general the same indicators. With $n = 58$ typical shift is positive. No negative changes were identified.

$$G_{contr} = \begin{cases} 13 \ (p \leqslant 0.05) \\ 10 \ (p \leqslant 0.01) \end{cases}$$

G_{emp} – a number of untypical shifts, so $G_{emp} = 0$, $G_{emp} < G_{contr}$. It means that H_0 is not proved, but H_1 is accepted.

The introduction of the training program based on the cloud technologies has had a positive impact on all states of the reduced capacity, in particular among the experimental group participants.

Thus, there was an increase of 10.00% (from 10.00% to 20.00%) in the number of people with a low level of fatigue, which indicates that future professionals perform mental work online without exhaustion and significant errors. Due to this, the number of respondents with medium indicators of this state decreased by 3.33% (from 83.33% to 80.00%). Future specialists gained skills of rational organization of mental activity, which allowed them to get rid of high-level indicators on this parameter (from 6.66% to 0), which proves the ability of students to perform mental activities and tasks without deterioration of the working capacity. Analyzing the indicators of this state manifestation in the control group, only partial shifts were noted (a number of people with a high level decreased by 3.57% and a number of people with a medium level of fatigue increased accordingly). With $n = 58$ typical shift is positive. Negative shifts – 37.

$$G_{contr} = \begin{cases} 50 \ (p \leqslant 0.05) \\ 46 \ (p \leqslant 0.01) \end{cases}$$

G_{emp} – a number of untypical shifts, so $G_{emp} = 37, G_{emp} < G_{contr}$. It means that H_0 is not proved, but H_1 is accepted.

Accordingly, the work, which was carried out, also affected the indicators of monotony. It has to be noted that significant changes are noticeable in the experimental group. Therefore, the indicator of a high level of monotony decreased by 6.66% (from 10.00% to 3.34%). The participants demonstrated an increase of attention and the general ability to strong-willed efforts, they showed their general inclusion in innovative mental work. It should be noted that the number of people with a medium level decreased by 3.33% (from 76.66% to 73.33%) and the number of students with a low level of monotony decreased by 9.99% (from 13.34% to 23.33%). By developing the ability to gradually approach the perception and performance of intellectual actions, gradual mobilization and appropriate adjustment of the body to more effective execution of these actions, students learned to adaptively perceive the latest online intellectual activity, while maintaining a high level of working capacity. Assessing the indicators of this state manifestation in the control group, we noted only partial changes (there was a decrease in the high level by 3.58% and, accordingly, an increase in the medium level of manifestation of monotony). With $n = 40$ typical shift is positive. There were no negative shifts identified.

$$G_{contr} = \begin{cases} 14 \ (p \leqslant 0.05) \\ 12 \ (p \leqslant 0.01) \end{cases}$$

G_{emp} – a number of untypical shifts, so $G_{emp} = 0, G_{emp} < G_{contr}$. It means that H_0 is not proved, but H_1 is accepted.

According to the indicator of mental oversaturation, it was found out that due to the introduction of highly efficient cloud technologies in the development of professional stability (namely, diversification and emotional saturation of mental activity in the process of performing practice-oriented tasks), low level of this state increased by 13.33% (from 26.67% to 40.00%), so future professionals have learned to perceive mental activity without a wish to stop it. Accordingly, the indicators of the medium level of oversaturation decreased by 13.33% (from 73.33% to 60.00%), indicating the formation of respondents' ability to accept subjectively uninteresting activities without changing the stereotype of performing reasonable actions. In the control group the oversaturation indicator remained unchanged. With $n = 58$ typical shifts are positive. Negative sifts – 37.

$$G_{contr} = \begin{cases} 50 \ (p \leqslant 0.05) \\ 46 \ (p \leqslant 0.01) \end{cases}$$

G_{emp} – a number of untypical shifts, so $G_{emp} = 37, G_{emp} < G_{contr}$. It means that H_0 is not proved, but H_1 is accepted.

Thanks to this work done, it was possible to increase by 16.67% the number of people with a low level of stress (from 20.00% to 36.67%), which indicates an increase in their stress resistance and the formation of skills of self-regulation of their own psychophysiological state. Due to this, the number of people with a medium level of this state decreased by 16.67% (80.00% to

63.33%), they have an experience of overcoming a difficult stressful situation. In the control group the indicators of stress remained almost unchanged.

The training work helped to increase students' neuro-psychological stability. According to the formative experiment results, there was an increase in the level of neuro-emotional stability in both experimental and control groups. But more significant changes took place in the experimental group. In particular, the number of people with a low level of neuro-emotional stability decreased by 10% (from 66.66% to 56.66%) and the number of people with a high level of this indicator increased by 10%. This states that the respondents have become more optimistic about the reality when doing the educational activities in the online format under quarantine restrictions. They adequately perceive new transformational innovative requirements of the intellectual and educational environment. These shifts in the control group were shown only partially (there was a decrease by 3.57% in the number of people with a low level and, accordingly, there was an increase in the number of people with a high level of neuro-emotional stability).

Thus, the results of statistical processing of empirical data proved the effectiveness of the training program, based on cloud technologies, in the process of developing the future specialists' professional stability in the modern educational environment. The corresponding program, in contrast to the traditional training, has certain advantages, which were identified according to the feedback, received from the participants:

- personal orientation and personification;
- possibility of in-depth study of personal problems;
- psychological and emotional security;
- free timing and autonomy in performing practice-oriented tasks; selection of the tasks depending on personal requests, etc.

5. Conclusions and future work

Cloud services are emerging as a powerful tool for enhancing the quality and efficiency of education, especially in the context of quarantine and social isolation. They enable the creation of learner-centered information environments that support personalization, individualization, collaboration, and networking. They also facilitate the development of professional competencies and information literacy among future specialists. However, the use of cloud services in education also poses new challenges and requires new skills and strategies from both educators and learners. Therefore, we propose a model for developing future specialists' professional stability with the help of cloud services, which aims to foster their adaptability, creativity, and self-regulation in the face of changing demands and opportunities in the modern world. Our model is based on the integration of cloud technologies in formal and informal education, as well as on the monitoring and evaluation of the individualized and personalized learning outcomes.

Our future work will focus on designing and implementing technologies for applying our model in various educational settings, taking into account the individual characteristics of learners in online learning. We will also explore the possibilities and limitations of cloud technologies for supporting different types of learning activities and interactions, as well as for enhancing the quality and accessibility of education.

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