

## CLOUD-BASED ENVIRONMENT OF PEDAGOGICAL TRAINING OF PRIMARY SCHOOL TEACHERS IN HIGHER PEDAGOGICAL EDUCATIONAL INSTITUTIONS



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**Abstract.** The article highlights the need to create an innovative learning environment - a cloud-based environment of teacher training of primary school. Author determined the specific implementation of IT in the process of mastering by future teachers of primary school the courses, "School Organization and Management" and "Methods of professional work of teachers in the innovative educational environment", in order to reinforce the effectiveness of teaching with the IT use in educational process of university.

Components of cloud-based environment of pedagogical training of primary school teachers are presented as separate dynamic, open subsystems that form a single integrated system, its goals are quality pedagogical training of competitive mobile modern teachers of primary school. The content of the environmental reflects the attributes of teacher's professional activity and general professional teaching knowledge and skills.

The didactic importance of cloud-based environment is determined. It increases the efficiency of elementary school teacher training, and it depends on logic application and determination of the place of rational approaches in cloud technology selection.

It is concluded that the introduction of a cloud-based environment of pedagogical training of primary school teachers to university learning environment creates optimal conditions for the formation of a continuous and logical innovation system of training of future teachers: teacher-innovator, teacher-modernizer and teacher professional.

**Keywords.** *designing, discipline, cloud technology, subsystem, teacher personal website, electronic educational classroom, teaching materials.*

### Problem setting.

In the process of solving social and economic problems in Ukraine the important role is taken for training system of teachers, especially primary school teachers. This vision can be explained by the fact that every student, starting from the first years of study, has brought up as a future citizen of our country, patriot with interests and high culture and behavior, life and activity in the modern globalized society. Under the reforms in education the role of pedagogical skills of teachers in the primary education field and their active position is increased. Important for them is the ability to set goals and objectives and understand the extent of their achievement, the ability of regular and continuous management of training process and education through involvement of innovative applications. Therefore, future primary school teacher in universities should learn the active use of creative technologies, in particular the most favorable consideration of possibilities and types of cloud technologies.

By the personal and professional qualities of teachers the prospective requirements are formed which should find appropriate reflection in the professional qualification characteristics, curricula, programs, textbooks and manuals. After all, the teacher should be able to listen and hear, understand and accept each student as an individual, feel the inner desire and needs and positively influence on the direction of his motivations. The teachers should have the ability to influence on mentioned orientations by using humane and democratic style of interaction and communication with the younger pupils. Today, the most sharply is considered the importance of familiarization of a wide

range of teachers with the most urgent problems of training of next generation, formation of the ability to demonstrate the mobility and competitiveness in solving didactic problems.

**Analysis of recent research and publications.** Problems of informatization of education, IT introduction in the educational process of all educational institutions are reflected in researches: V. Yu. Bykov, A. M. Gurzhiy, M. I. Zhaldak, Yu. O. Zhuk, R.S. Gurevich, O. I. Ivanitskiy, A.V. Spivakovskiy, O.M. Spirin, L. E. Petukhova, O. I. Schieman and others. Conceptual foundations of professional and educational training of primary school teachers and the formation of the professionally significant qualities are reflected in researches of many scientists: (N. M. Bibik, N. A. Gluzman, T. G. Humennykova, P. M. Gus, M. D. Zahariychuk, L. V. Koval, O. A. Komar, Yu. M. Korotkova, V. M. Labunets, S. A. Litvinenko, L. L. Makarenko, S. M. Martynenko, I. A. Palshkova, D. I. Paschenko, L. E. Petukhova, O. J. Savchenko, L. O. Khomich et al.).

Analysis of scientific papers on the problem of primary school teachers teacher training, regulations and current status of informatization of higher education revealed a number of discrepancies between: the need of components structuring of pedagogical training of future primary school teachers and imperfections of traditional forms and means; increasing demands to quality and efficiency of educational process of primary school teachers and insufficient development of learning and research activity of students and methodological activity of professors of higher pedagogical educational institutions (HPEI) considering the IT possibilities; informatization trend of professional activity of primary school teachers and low level of students' readiness to IT use; need to develop the learning environment under conditions of information and insufficient development of methods of IT introduction in the process of primary school teacher training as part of the learning environment; need for constant improvement of level of primary school teacher training to use IT as functionally and personally meaningful component of professional training and undeveloped appropriate environment.

Purpose of article. Resolving of the contradictions requires solving the problem. It is in the necessity of design foundation of innovative environment of HPEI as multifaceted open dynamic systems, the

finding the methodological approaches, conceptual regulations, principles that will promote pedagogical training of primary school teachers in the information society.

**Research results.** Cloud-based environment of pedagogical training of primary school teachers (CBE PT PST) designing created the effective conditions for testing the efficiency of competitive pedagogical training of primary school teachers. Taken into consideration the definitions above, it is proposed the designed and implemented author's design of CBE. The conceptual principles of pedagogical training of primary school teachers in HPEI are interpreted and the continuity of the process of obtaining professional knowledge, skills formation and a mobile, competitive teacher are proven.

The purpose of the project was positive focus on improving the education system, including the content and organization of educational process in HPEI.

The purpose of designing CBE PT PST, according to the research's hypothesis is to build the foundations of the relationship of modern innovative educational paradigms; trends of globalization and information of society in general and education in particular; current state and prospects of development of primary education with orientation towards professional teacher competencies (knowledge, skills, readiness for activity in primary school), able to work in a competitive educational environment. The content of disciplines of primary school under conditions of CBE PT PST is made according to didactic principles and proposed as a continuous, dynamic open system, components of which are subsystems, revealing general, special, personal and disciplinary direction with regard interdisciplinary integration of teaching subjects - complexes of methodical guidelines (CMG), their contents and implemented teaching methods.

The development of IT skills of pupils depends not only on the quality of knowledge and skills to work with information, availability of computer technology in the school, connection to the Internet, the development of new teaching materials, but it also depends on the psychological and professional training of teachers to productive activities using IT.

Formation of the aspect of teacher training should be in the learning process of HPEI.

In Ukraine in HPEI future teachers of primary school study information technologies as a separate discipline. Students learn: how to use IT tools, methods and ways of searching, processing and saving of learning materials; the ability to measure the effectiveness of their use in the educational process; use a wide range of learning materials with use of IT; use electronic means of learning purpose; take advantage of distance learning; use electronic resources of computer networks. For example, in order to reinforce the effectiveness of teaching information technologies in Kamenetz-Podolsk National University the introduction of IT in the process of mastering of the discipline "School Organization and Management" was proposed. Focusing on the modern requirements for modular structuration of content subjects, in discipline "School Organization and Management" the availability of perfect blocks of didactic adapted information takes into account. We consider it appropriate to master knowledge of information block by two related semantic modules: "Theoretical bases of school management and organization as school management system" and "Peculiarities of methodical work management in school" [1].

For example, in the first module "Theoretical bases of school management and organization as school management system" the topic "Planning of school work" is considered. As a result of study future teachers of primary school should get skills of planning of school work; organize management activities on internally school control and use the elements of pedagogical innovations in the management process.

The study the discipline and in particular the theme "Planning of school work" is realized the organizer - calendar OneDrive - one of many tools of Microsoft cloud services, which provides users with a wide range of services and facilities, including [1]: handy calendar with clear interface; the ability to plan the day, week, month, etc.; creating tasks and related reminders; management of objectives; the ability to create address book; reminders via E-mail or SMS; execution tasks for self-activity study; execution tasks for the collective study; access from different devices; access from any location (territory); information security; synchronization of work

with own computer; synchronization of any folder on your own computer; active continuous development of OneDrive. To maintain user information there is 7 GB of disk space. Users, who are entitled to free upgrade, get 25 GB of disk space.

Training of future primary school teachers to basics of planning we consider to carry out by the following stages: theoretical training; practical training; self-activity work; teacher's control of tasks for self-activity.

The effectiveness and durability of lecture material mastering is largely depended on students' readiness for such activity. So the material is quite lengthy, before its studying future teachers of primary school are proposed the self-activity study. For this in the organizer - calendar OneDrive - at the day of scheduled lecturer teacher created and taught the appropriate tasks for students.

Before the lesson students received reminders via E-mail or SMS. This approach is used to enhance teaching and learning activity of students, their guidance for further independent study of educational material for active feedback. There is a push, motivation of future teachers to scientific thinking, independence and creativity, and as a result of training - the conscious perception of material, its ultimate and secondary understanding, memorizing and, if necessary (e.g. at practical works) - further reproduction.

The next step of theme's mastering is practical works, which according to the curriculum of bachelors specialty 013"Elementary education" are conducted in two weeks.

To strengthen of theoretical material the future teachers of primary education perform and creative tasks in writing the essay on the theme "Planning - top management function?" and the development of organizational and pedagogical conditions of successful planning of school work, based on the recommended scientific and methodological literature in the topic. So the creative abilities of students of the material of discipline "School Management and Organization" are formed and by using the organizer - calendar OneDrive - they are given the opportunity to study the problem for preparing to practical lesson and execute teacher's scheduled tasks a of creative character.

After tasks' execution of creative character and making them according to teacher's

requirements, students send the tasks to teacher via E-mail or SMS.

In order to form professional competence of future teachers of primary school the necessary condition is mandatory increasing of academic hours for self-activity study of content of each module of discipline on credit and modular system of training. Therefore, the third phase of topic's study is students' execution of self-activity work of the topic.

Organization of self-activity work is the aspect of pedagogical activity, it is not occurs only by classes exercises, but also within the extracurricular work of students. There is a need to focus the teacher on professional activity, in its structure the organization of self-activity study serves not only as a tool of mastering of future profession by the student, but it is a mean and a sign of his professional skill, i.e. it is demonstration of ability to organize activities of future pupils.

Tasks for self-activity study are studying of theoretical problems and its practical implementation of the students: to analyze of annual plan of school; develop approximate work plan of school director for the week; make a schedule of extracurricular activities for the second semester; analyze of work plans of methodical unity, to identify their common and different features. Help to future teachers of primary school in the discussion of the most important, complex and interesting questions of studied topic is given at chat consultation. For example, chat-consultation of teacher is planned beforehand; it is conducted in a specified time and one of modes of chat is chosen (one-time, daily, weekly). Teachers and students open the organizer - calendar OneDrive at the same time - to discuss more details of specific questions (e.g. for consultations in preparation for final control).

Organization of students' self-activity study in mentioned way is carried out on a new level at classes' exercises and at a distance. Scale and approaches of the organization of results' evaluation of creative achievements (at practice, individual lessons, at modular test, final test, messages during a chat-consultation, credit) are reflected in the methodical guidance, students are able to read its before the study discipline .

Evaluation phase is carried out in the classroom, chat sessions or during evaluation of students' self-activity work in the form of interviews, colloquiums, testing, chat-

consultations, credit, defense of individual research tasks (IRT) etc. Educational achievement of future teachers of primary school from all planned kinds of tasks (theoretical training, practical work, IRT, self-activity task, creative tasks etc.) are evaluated quantitatively, the rating is set.

The introduction of proposed system in teaching the discipline "School Management and Organization" as well as other pedagogical oriented courses, enables to increase the activity of student learning, objective control and evaluation of acquired knowledge and skills, the IT competence formation.

According to our research, cloud services, for example, OneDrive, are effective in the work of teachers, teachers of higher educational institutions, who include modern technologies in the educational process.

The effective organizational and methodical decision as a systematic influence on professional competence formation was introduction the discipline "Methods of organization of teacher's professional activity under conditions of innovative educational environment" to the curriculum of future teachers of primary school training. Purposefulness and flexibility of subordinate of aim and objectives to didactic needs of HPEI, independence in the choice of subjects - it points to free determination of personal preference, the choice of types and forms of educational activity of each subject of educational process.

The project CBE PT PST in HPEI is implemented in teacher training system in HPEI and realized as a modern form and means of support and continuity of pedagogical process. Its implementation is the use of complex of educational influences and it is realized through the algorithm that describes the process of gradual mastering of educational activities: educational, organizational, and informational and research at studying basic pedagogical disciplines, the selective discipline "Methods of teacher's professional activity in innovative education environment "and educational practices.

The structure and content of CBE PT PST is a indispensable and sufficient single whole for high-level of future teachers of primary school pedagogical training with formed mobile, competitive specialist. Components of CBE PT PST are separate dynamic, open subsystems that form a single integrated system; the

goals are quality pedagogical training of competitive mobile modern teachers of primary school. Content of CBE PT PST reflects the attributes of professional activity of primary school teachers and general and professional teaching knowledge and skills.

Content is formed in accordance with regard to the prospects of the organization of differentiated and individually oriented education, the formation of individual trajectory of the educational process. Applied component of CBE PT PST project reproduces only a dynamic, integrated process of professional pedagogical competences formation in the subject field on the degree of specialist. The project's structure, according to the examined aspects in previous items, covers four interrelated components (subsystems) that reveal general, special, personal and disciplinary trend:

- subsystem of general trend – organizational mechanism, the essence of which is the continuity of teacher education.
- subsystem of special trend – taking into account the peculiarity of pedagogical training changes due to reforms of educational sector "primary education", education degrees of specialist.
- subsystem of making motivational factors in HPEI through innovations implementations
- subsystem of disciplinary degree taking into account the peculiarities of future teachers of primary school and possible influence on the process of informatization of education.

Tools of interactive learning process are integrated in CBE PT PST: OneNote - the organizational unit (create notes and organization of personal teacher's information); Skype - the implementation of mutual messaging ( documents, images sending, etc.), screen demonstration; GoogleDisk - images, text documents, spreadsheets, audio and video files storage; SkyDrive (OneDrive (Word, Excel, PowerPoint) - file storages, personal teacher's website (Access: <https://bahmat.at.ua>); OneNote (data synchronization with different devices).

Management of training process and its organization is directly conducted by the teacher in learning environment of HPEI and via the teacher's electronic educational classroom (EEC). The teacher's electronic classroom is electronic educational resource, it is virtual reproduction of classroom (audience) of HPEI, it is created in the educational social

network «Accent» (<http://accent.com/index.php/jomsocial>). Electronic classroom contains the modules:

- Technical (registration, search engine, statistics), "E-Library" is electronic educational recourses (EER) of profile purpose ( EER from basic Web-library "ACCENT"; EER – authoring of N.V. Bakhmat, intended for use in the current E- CL); "E-audience" (submodules: "Work Field" - reproduces the traditional audience with the possibility to conduct classes in real time and distantly (in time and territorial sense), "E-communication" is designed to communicate in real time and distantly (in time and territorial sense), "Monitoring of Classes and Attendances" is record-keeping, register etc.

- Methodical material containing material, distributed by owner of EEC (teacher) as the sub modules' content: for students; for teachers.

Electronic parents' meetings are designed to communicate with parents, individuals or with a group of parents, parent committee; in hidden mode to others and in open; in real time and distantly (in time and territorial sense).

Electronic educational classroom is intended for: conducting studies in various organizational learning forms; problem's solving of organization and support of distance learning; training for persons who are temporarily in the occupied and geographically distant territories, and have special needs; schools during the pandemia and worsening of epidemic situation etc. establishing links between subsystems of disciplinary level, general and special trend and creation the motivational factors of systematization consideration in cloud storage of methodical materials located in the Web-library "ACCENT" in HPEI

Teacher gives access to specific educational materials for students and other teachers via Dropbox. Special role in the organization and management process of future teachers training is assigned to teacher's personal site. Online teacher has the opportunity to present messages, notifications and virtually conduct additional arrangements that is adjacent to the training and education of future teachers and efficiently promote professional future teacher's development. Module "Forum" is designed to discuss any problem relating to education, including the training of future primary school teachers. On

the pages of the module "Guest Book" users are able to express their comments, suggestions and wishes. The registered users including students have the opportunity to present the photos". Students download photo reports and videos of pedagogical practices, they are the training material for common study of teachers and students.

In CBE PT PST building there is focus on the integrity and consistency of the training system of future primary school teachers, the authoring integrates in it as valuable and necessary part of the traditional learning environment of HPEI. Introduction of CBE PT PST except of achieving of training objectives is to transform the imagination of future teachers about necessary continuous renovation of tools of professional activity as a means of personal and professional formation and qualities of becoming competitive. The developed CBE PT PST can be effective when its conditions do not harm the physical and mental health of subjects of the educational process. It takes into account the individual needs and characteristics of each student (insight, temperament, organizational skills, etc.) and increases the professional and pedagogical skills. Consideration of physiological properties of subjects of the educational process, the research and analytical processing of their personal qualities - personally-oriented approach is the basis for consistent integration of IT forms, IT methods, IT tools and IT means of learning and education to the traditional education system of HPEI.

Versatility and diverging of cloud technologies, used in the authoring, becomes the motivating factor that generates the principle: "Work per sample" The level of mastering of modern technologies by the teacher of HPEI; the ability timely and appropriate to strengthen and enrich the activities by creative arsenal of innovative IT tools is often interested for young people. In addition, the adequate awareness in IT of current students (high user's level shows 92%), demonstration of teacher's skills to add IT to educational technologies promotes the formation of one of the components of future teachers' professional skills - the ability to self-education. IT variety and the principle of "work per sample" activate the process of heritage of the pedagogical technique that becomes the semantic feature of personal teaching experience of competitive specialist.

The concept of CBE PT PST building, which is based on a logical, structured and organic combination of traditional and innovative educational means, requires the design and development of technologies that enable a uniform, consistent educational process updating, appropriate replacement and \ or complement of traditional methods and learning tools which are ineffective and, consequently, will certainly contribute to improve learning outcomes. The author's practice experience under conditions of involvement of CBE PT PST in learning environment of HPEI indicates that one of the most effective forms of IT use in pedagogical training of future primary school teachers is the inclusion of varieties to all teachers' activities: communication, organizational, educational and educational. Didactic significance of CBE PT PST is professional training improvement it depends on logic application and determining the place of rational approaches in cloud technologies choice. In particular there are:

- forming of motivation of learning activity of students; forming of awareness of necessity of IT use with the aim of learning and acquisition of knowledge; the possibility of implementation of interactive training, it will complement the motivation and enhance the emotional specific of educational process; providing flexibility with a choice of individual learning based on personally-oriented approach;

- dynamic of the learning process of differentiated approach to learning, the formation of skills; providing the possibility of individual and collective (group) study of different organizational forms - full-time and distance; the opportunity for diagnosis and control of knowledge in all stages of education;

- availability of feedback to correct the educational process; ensuring the availability, clarity and transparency of management means of educational activity; the conformity to didactic principles of educational material presentation; the possibility of implementing a creative approach with searching and selecting of innovations means; providing of multilevel training organization by combining the possibilities project's subsystems, which open general, special, personal and disciplinary guidance in forming a mobile, innovative, creative and competitive creative teacher of primary school.

Getting free access to methodical materials, support tools of professional work aimed at improving the learning outcomes and improving the quality of education, teachers of HPEI may at a higher level to help future teachers in learning, form the motivation for learning. The opportunity of ensuring their access to open and systematically renewed sources of educational materials is valuable. Integration of various cloud technologies promotes the development of skills and the desire to self-obtaining of information, which is necessary for obtaining meaningful pedagogical knowledge. New quality of components of CBE PT PST outlines the new quality of training system of future primary school teachers in HPEI. It is explained by the

implementation of interactive learning, the use of personal oriented and differentiated approaches and appropriate cloud technologies promote subject formation skills of students.

CBE PT PST introduction in the learning environment of HPEI creates the optimal conditions for formation of a continuous and logical innovation system of future primary school training system: teacher- inventor, teacher-modernizers and teacher-professional. The purpose of the project was its focus on improving the content and structure of training of pedagogical disciplines in HPEI to justify the system of primary school teacher training as competitive professionals.

### Conclusions and further research prospects.

The reality causes the necessity of teachers of primary school training in HPEI as highly educated professionals, able to timely flexible reformatting of trend and the content of their own professional activity, selection and evaluation of new forms, methods and means of education that are motivated by the influence of information education and society in general. The teacher should have a high level of pedagogical skills and be prepared for organization of educational activity, aimed at creative learning by students, the formation of skills and abilities of self-control, self-analyses and self-assessment, the ability to comprehend the information.

According to these conditions of primary school teacher training in HPEI, it was seen the need to design the environment, its conditions promote the competitiveness formation, its generalized signs are: keeping the continuity of teacher training; keeping continuity and interdisciplinarity between didactic, methodological and pedagogical disciplines; keeping the continuity between the stages of technological training; purposefulness of formation process of readiness for IT use in primary school as a component of professional competence; effective organization of researches ; the development of modern forms, means of solving of professional educational problems, with the appropriate IT involvement; the development of modern and efficient form of professionally-oriented teaching practice; expedient and rational integration of traditional and innovative learning technologies; continuity of teacher training monitoring for development and use of special tools.

In determining components of author's project CBE PT PST, it was taken into consideration they have maximum promote formation of all kinds of educational activity and subjects' competencies (including IT competencies); they have to conform to the logic and structure of educational process of HPEI; they should include the traditional educational technologies and means. Prospects of ensuring competence approach in CBE PT PST in HPEI are: departing beyond knowledge educational environment; intensification of activity-practice-orientation training; tracking the requirements of society to modern primary school teacher; constant motivation of teachers to engage in professional activities; mastering of self-possession technology of personal achievements; providing transition from didactic stage of self-determination to stage of professional self-fulfillment in a variety of educational situations etc.

Thus, pedagogical training of primary school teacher is a purposeful controlled process that ensures the formation of pedagogical competences, his personal qualities, necessary for the successful and effective implementation of professional activity. Like any other process, teacher training has its goals, objectives, structure, functions, which are carried out under certain organizational and pedagogical conditions - formed the innovative integrated CBE PT PST and it involves mastering knowledge of pedagogy of primary education, formation of pedagogical competences on didactics principles, regulations and requirements, ability to perform reflection of personal activity by future teachers.

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