

Blogger and YouTube services at a distant course “Database management system Microsoft Access”

Dmytro A. Pokryshen¹[0000-0001-9572-413X], Evgeniy H. Prokofiev²[0000-0002-7708-5802] and
Albert A. Azaryan³[0000-0003-0892-8332]

¹ Chernihiv Regional Institute of Postgraduate Pedagogical Education named after
K. D. Ushynsky, 16, Hoholia Str., Chernihiv, 14005, Ukraine

² Bogdan Khmelnytsky Melitopol State Pedagogical University,
20, Hetmanska Str., Melitopol, 72300, Ukraine

³ Kryvyi Rih National University, 11, Vitali Matusevich Str., Kryvyi Rih, 50027, Ukraine
pokryshen@ukr.net, prokofiev@mdp.u.org.ua, azaryan325@gmail.com

Abstract. The article is devoted to the coverage of the course “Database management system Microsoft Access”, an educational blog review “The development of a creative child. ICT”, which is used as an auxiliary tool for promoting a course and teacher in the Internet, structural analysis of this blog is made. The channel location is set on YouTube video hosting and how it is used in the course on databases. Attention is drawn to the fact that theoretical and practical material is considered on real, implemented informational and analytical systems. To prepare students for the Olympiads and provide methodological help teachers of computer science are looking at tasks from databases that were offered at the All-Ukrainian Olympiads on Information Technologies, especially II, III and IV stages (offline and online Olympiads), which are located in open access to the blog and YouTube channel. The main focus of the article is devoted to the practical side of teaching teachers of computer science, experience in using the above technologies.

Keywords: DBMS, Access, Microsoft, Google, YouTube, Blogger, training method.

1 Introduction

Most of the modern educational approaches are closely linked to the new information and communication technologies (ICT). In addition, new state training standards of teacher training point to the need teacher’s preparedness to create, develop, filling the educational environment, which is possible in the presence of a high level possession of ICT and information culture. In this case, it is not only a matter of course among teachers of Computer science, and about all employees of education.

One of the tests at the All-Ukrainian Contest “Teacher of the Year” in all nominations were an examination of the level of ownership of ICT and evaluation of the Internet resource of participant in order to stimulate their creation, development and raising the level of information culture. However, it has been two years since this form

has been canceled due to the fact that all educators should already have free access to ICT. Thus, the system of postgraduate pedagogical education should demonstrate how, in addition to well-known approaches, to use new technology. At the same time, these technologies should not be overloaded by redundant options and do not require special technical training, material and technical base. No less importance in working with adults is their own professional and life experience, psychological and cognitive specifics. Therefore, the usage of ICT and cloud services in particular [12; 14; 15; 16; 17; 19; 21; 24; 29] should be considered taking into account: the educational needs of the teacher, his psychological features, regulatory framework, achievements of modern ICT, accountability future requirements of society and the educational sector, the real state of the present material and technical base, readiness of scientific and pedagogical workers and the administration of the university to such activities, the achievements of native and world science.

Problems of introduction and usage of innovative and informative technologies in the educational process, forms and methods of teaching informatics are devoted to the research of scientists Valerii Yu. Bykov [1], Roman S. Hurevych [4], Andrii M. Hurzhii [5], Nataliia M. Kiiianovska [7], Oksana M. Markova [13], Nataliia V. Morze [18], Serhii A. Rakov [22], Yurii S. Ramskyi [6], Serhiy O. Semerikov [8], Illia O. Tepytskyi [26], Yurii V. Tryus [28], Yuliia V. Yechkalo [25], Myroslav I. Zhaldak [31] and others. Questions of distance education, relevant information and pedagogical technologies are considered in works by Vladimir N. Kukharenko [10]. Pedagogical peculiarities of adult education are given attention in research Boris S. Gershunsky [2], Irina A. Kolesnikova [9], Ivan F. Kryvonos [32], Larysa B. Lukianova [11], Klaus W. Vopel [30], Ivan A. Ziaziun [33] and others. Aspects of continuity and postgraduate education are considered in the works of Nina V. Bordovskaia [23], Irina A. Kolesnikova [9], Viktor V. Oliinyk [20], Artur A. Rean [23], Ivan A. Ziaziun [33] and others. In his works Serhiy O. Semerikov [27] emphasizes the need to increase the role fundamental informatics education in order to form the informatics competences of pedagogical workers. In the dissertation of Yurii V. Horoshko [3] efficiency use of self-developed software products and organizations of the educational process of training computer teachers around reviewing these products is emphasized.

2 Research problem

This way, we need to adapt the methodological system of learning informatics in institutions of postgraduate pedagogical education with taking into account the above-mentioned aspects, namely, the educational needs of teachers, their psychological and age-specific features, new pedagogical and informational technology, available material and technical base.

Let us consider the distance course “Database management system Microsoft Access”, which is included in the annual plan of advanced training courses Chernihiv Regional Institute of Postgraduate Pedagogical Education named after K. D. Ushynsky.

3 Discussion and results

The purpose of studying the course is the formation of knowledge, skills and techniques of receptions processing of data, as well as design and creation of elements information systems using a wide range of instrumental options modern database management systems (DBMS) for development components of the information culture of listeners and the disclosure of their creativity the potential.

The tasks of mastering the course are:

- formation and development of the base of the subject competencies in the ICT for their qualitative use in educational cognitive and professional activities and information expansion worldview;
- training in conducting major operations on information objects, in particular, the creation and processing of various information objects in the DBMS;
- development of algorithmic, logical and critical thinking;
- development of scientific thinking, aimed at conducting research, self-extraction and processing of data pedagogically weighed use DBMS;
- teaching the observance of safety conditions during work with information systems.

The obtained knowledge will help in preparation for the all-Ukrainian student Olympiads and Internet Olympiads on information technologies.

Students must have sufficient knowledge and skills to successfully master the material the primary skills of working with the operating system (windows, menus, switches etc.) and other programs, including Microsoft Office (Word, Excel), are free have a graphical user interface, have basic knowledge and skills work in DBMS Access. It is also desirable to sort and filter data, calculate the results using the functions in the table processor. It will allow to focus on the peculiarities of the database management system data.

The course is designed for teachers of computer science who deal with students who take participation in the I, II and III stages of the Olympiad on information technologies and all of them is interested in designing databases using Access 2010 DBMS.

Like most universities, we use the distance learning platform Moodle with all its sections: theoretical material, forum, testing, note about success and others.

Theoretical and practical material is presented as text documents and divided by topics. Documents with lecture material have the title "Lecture".

Theoretical and practical material is considered on real, implemented information-analytical systems. Among them you can select "Institute", "Dean's Office", "Science". To prepare students for the Olympiads and the provision of methodological assistance to the teachers of informatics are considered tasks with databases, which were offered at all-Ukrainian Olympiads on informational technologies, namely II, III and IV stages (offline and online Olympiads).

When performing laboratory work it is important not to miss the execution tasks set. Each subsequent laboratory work is based on the material of previous work. After performing the laboratory work according to the schedule pass the course you need to put a mark (5 points) in the document-progress report.

Almost every topic is given tasks for independent work and control question. They are provided for self-control success. Upon completion of theoretical and practical material passing proposed (according to the schedule) implementation of practical tasks and testing from the module. The test results of the course listener will be seen immediately. The results of the practical tasks must be sent to the electronic post of author of the course.

After completing submission of performance results, a breakdown is proposed practical tasks as a video tutorial. On the basis of which each evaluates its own completed work and displays the result in the Certificate of Success document. Depending on the complexity of the tasks and the need, video tutorials are added different topics.

At the end of the passage of all modules it is suggested to execute the project with development of the information-analytical system. The listener can independently define the theme or choose from the suggested ones.

Taking into account the peculiarities of the work of institutions of postgraduate education and higher education qualifications of teachers in accordance with the Laws of Ukraine “On education” and “On higher education” teacher has the right to independently choose a place and a teacher from whom take courses. Thus, the author of the course and the relevant structural units of the institute must disseminate information about available courses available. Educational platform should not be completely closed and at the same time open (authenticated access to materials). Centralized (authenticated) access to the materials is provided by the Moodle platform.

We use one of the distribution channels for the course information educational blog “Development of a creative child. ICT” which acts as an advertising platforms for specific courses and demonstration of the teacher’s work. Let’s do it a small overview of this online resource.

The main purpose of resource development is the formation and development in its users of informational culture, informational competencies, creative abilities based on the use of ICT in educational and everyday activities. Among the tasks that are solved using this blog, we select the following:

- assistance to teachers in the interest of students to modern technology; demonstration achievements of modern science and technology;
- dissemination among teachers of modern innovative methods, forms and means training (world and domestic);
- distribution of advanced pedagogical experience of pedagogical and scientific-pedagogical workers;
- providing methodological and scientific assistance and support;
- popularization of world experience in the development of creative abilities; motivation to creative approach to educational activities;
- distribution of software and pedagogical support, definition methodical, technological, technical requirements and recommendations for development educational toolkit (information systems, didactic material, etc.).

The selection of material is aimed at different audiences:

- teacher subjects: elementary, secondary and high school;
- teachers of computer science, which are engaged in preparing students for all-Ukrainian student Olympiads, tournaments and external independent evaluation with informatics (information technologies);
- students and other users who are interested in the achievements of mankind with modern computer technology and programming.

The main page of the blog is shown in Figure 1.

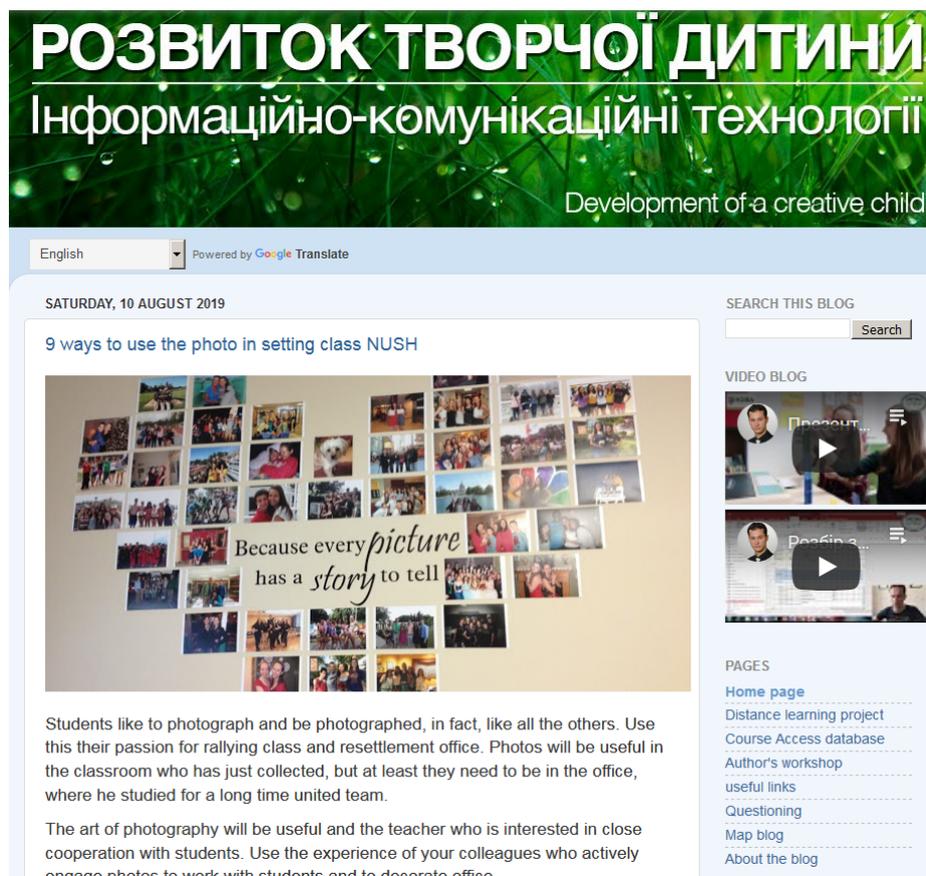


Fig. 1. The main page of the blog “Development of the creative child. ICT”
(<http://tvorchistd.blogspot.com>)

Blog Structure:

Statistics. The total number of views since the installation of the meter is more than 380,000. Launched in May 2013, it has 600 publications, 7 pages and 8 sections.

The layout includes the following technologies and gadgets: Google translate to choose a language; blog search; pages; sections (labels, labels, labels) with posts in this

topic (8 categories); banners; 7 popular publications; subscription by e-mail; regular readers; supporters; code for posting a blog banner on other resources; total view count, counter from HotLog and flagging the states from which the blog was viewed; demonstration of recent views; archive as a field with a list; feedback form; recommended publications for each post; video author's window on YouTube; data about the author – Dmytro A. Pokryshen.

Design. This blog uses the “Venetian Window” template. Above is the logo of the blog in Ukrainian and English, has its own icon. The main part consists of two columns: the first reflects the publications (12 last), the second is for gadgets.

Pages. Among the pages is the *Home*, which contains all the messages in the chronological sequence. There are 12 posts in total, each of which has recommended similar publications.

Useful links that include links to various resources on the Internet are divided into categories: Creativity sites, Internet resources on informatics, Specialized websites of children's literature, Educational information resources, Internet sites of libraries and electronic libraries, Internet sites of museums and art galleries of Ukraine. The list of links is constantly updated. A characteristic feature of the links placed is that they are really useful to educators and are different from the generally accepted extension of references to administrative organizations.

The *Blog* page contains blog information, the purpose of creating and using it, the task, the author information.

The *Questionnaire* page contains an entry form, an initial questionnaire, and, if necessary, conducting additional research, placed relevant links to forms questionnaires.

The *Access 2010 Database Course* contains information about the proprietary course, the purpose, the task, the curriculum, the link to the registration form and the distant platform.

The *Distance Learning project* page is intended to introduce distance learning courses conducted by the Dmytro A. Pokryshen and the department of informatics and ICT in the education of Chernihiv Regional Institute of Postgraduate Pedagogical Education named after K. D. Ushynsky, their description and reference to the remote platform where the didactic materials of courses are already located : ICT in education, Web 2.0 social services in the professional orientation of pedagogical workers.

Educational Internet resources for school teachers in introducing a healthy lifestyle for students, Designing information-analytical systems, Programming and algorithmization, Fundamentals of UX, UI and Web design. At this stage, a project is being developed to support the organization of distance learning in general education institutions. All courses offered are copyright.

Sections. For Teacher Assistance, Downloads, Olympics, Primary School, Secondary School, Senior School, Theoretical Material, Interesting Video Content – the title of the section corresponds to the topics of the messages posted there.

In the section of interesting video materials posted fragments of television programs or a link to them on the YouTube channel with comments on them. Among them, many cognitive programs are produced by Discovery Chanel, a selection of videos about the world of the future, Google projects, video tutorials, an overview of modern

technologies, the possible development of society and technology, and much more. Placed videos range from a few seconds to full-length movies.

The section of the theoretical material refers to more general messages that will be useful to different categories of users. Here are some definitions of modern scientific terminology, fragments of interviews with scholars and people who deal with ICT, the achievements of modern computer technology, and other useful material are considered.

The sections of elementary, secondary and senior schools include theoretical and practical material relevant to the relevant age group.

Section *The teacher's assistance* is devoted to advanced pedagogical experience, modern forms, methods and means of teaching and materials with which you can interest students to study. Materials mostly relate to computer science and science and mathematics.

The section of the Olympiad contains materials related to the preparation and outcomes of All-Ukrainian and International Olympiads and informatics (programming) and information technologies tournaments. Among the materials you can find tasks, author's solutions, suggested solutions for participants of these events, methodological and pedagogical recommendations, normative documents, lectures from the leading IT specialists of the world.

Pages on the blog banner have a language selection box (Google Translate technology). With the help of which you can make a machine translation of all posted messages to the desired language, which makes it easier to view materials from users from other countries. As the site statistics show, the audience includes users from different countries, such as Ukraine, Russia, USA, Poland, Germany, France, the Netherlands, and others (Fig. 2).

Not all materials posted on the blog are authored, so links to the original hyperlink to the source are provided.

Blog "Development of a creative child. ICT" is positioned as an electronic tool for educational purposes that can be used by teachers, postgraduate pedagogical education institutions, heads of schools and faculties and students. This blog is quite popular among informatics teachers and students of Chernihiv region during preparation for participation in all-Ukrainian Olympiads and tournaments on informatics, IT.

The blog is located at the Internet at tvorchistd.blogspot.com on Google's Blogger platform. When using search engines with keywords development of a creative child, the first link will be on the proposed blog (Fig. 3).

Since September 2015, a blog has been linked to the Dmytro A. Pokryshen's YouTube channel with video blog posts that are relevant to the educational subject. At the moment, the video blog consists of several playlists: an author's workshop, a promising pedagogical experience, video blogs, Access 2010 databases. In the first place there are materials from workshops and trainings, photo reports from events held in Chernihiv Regional Institute of Postgraduate Pedagogical Education named after K. D. Ushynsky; in the second interview with pedagogical and scientific-pedagogical workers who share their pedagogical experience; in the third general purpose material.



Fig. 2. Page of the statistics of the blog “Development of a creative child. ICT”

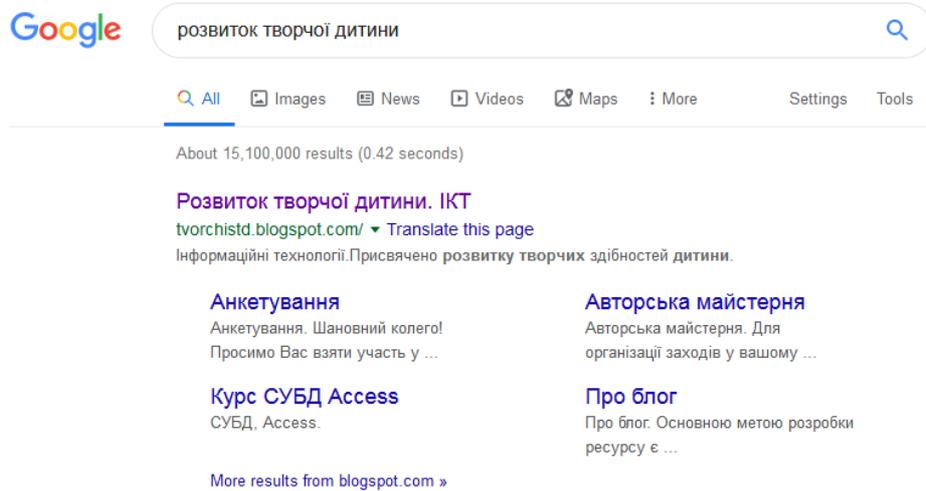


Fig. 3. Search results in Google search

In the latter – published video materials that address the problem of training DBMS Access 2010, preparation for the Olympiad on IT, methodology for solving database

problems. A link to video blogs can be found by Dmytro A. Pokryshen's name on YouTube (Fig. 4).

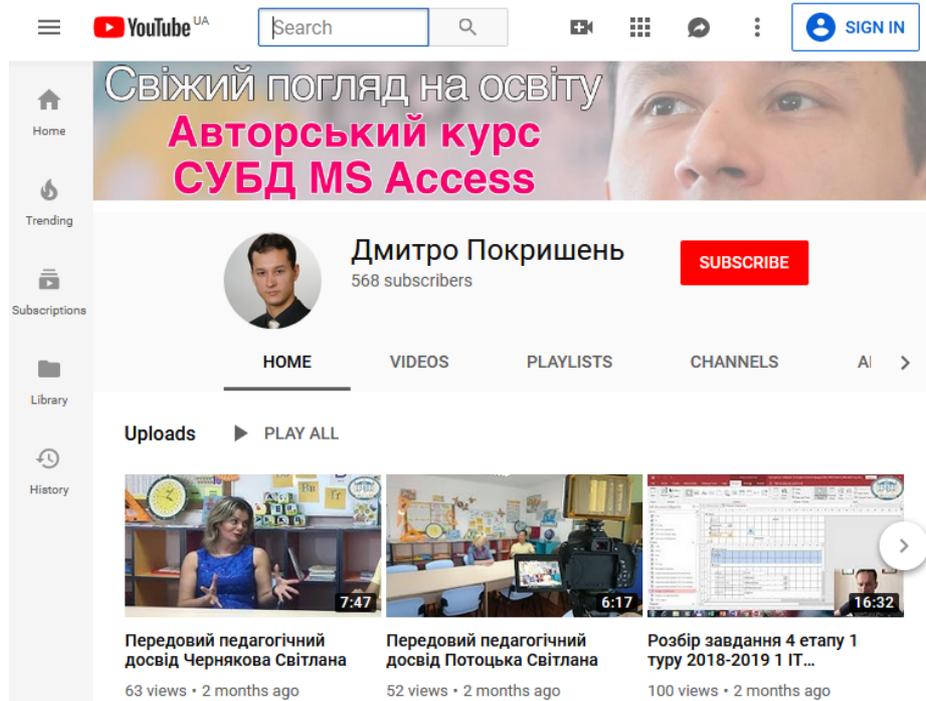


Fig. 4. Channel on YouTube
(<http://www.youtube.com/channel/UCBtS1s2ryw2s0qwSwrX5haw>)

The use of the video channel is also one of the areas for promoting educational courses. For modern youth very actively uses video hosting YouTube.

Short video completed for up to five minutes with explanations for a specific topic showed their effectiveness. With the help of this service it is easy to organize long-term live streaming to the network with a record, chat and comments to them. With a webcam with a built-in microphone (or a regular laptop), the technological part of recording, broadcasting and capturing the screen is reduced to a few clicks. And using a smartphone to shoot and mount a video lesson for up to 5 minutes is not a complicated process.

Among the shortcomings is the low number of views, because it is not solving content, but rather highly specialized, taking into account the Ukrainian-language material supply, the audience is narrowing even more. The analysis of narrow-petitioned blogs has shown that the availability of 500 regular readers is a good result.

4 Conclusion

So while studying the distance course “Database management system Microsoft Access” by combining various content management platforms, namely Moodle, Blogger, YouTube, we meet the educational needs of educators on the use of the DBMS and prepare students for the nationwide Olympiads on IT, taking into account their professional features, we use new pedagogical and information technologies, and all this does not require a large and complex material and technical base.

Each of these tools is not separated from each other, but harmoniously complements and allows you to look at them from the other side. The teacher is trained in such a course, in addition to obtaining substantive knowledge from the database, sees the use of various technologies in the educational process. The availability of such competences is provided by the basic standard of teacher training. Thus, the role of teacher of postgraduate pedagogical institution from the usual source of knowledge changes for a specialist who is a leader in new technologies.

References

1. Bykov, V.Yu.: Modern tasks of informatization of education. *Information Technologies and Learning Tools* **15**(1). doi:10.33407/itlt.v15i1.25
2. Gershunsky, B., Lozansky, E.: *Russia: experience in democracy*. Kontinent USA, Washington (2000)
3. Horoshko, Yu.V.: *Systema informatsiinoho modeliuвання u pidhotovtsi maibutnikh uchyteliv matematyky ta informatyky* (The system of information modeling in the preparation of future teachers of mathematics and informatics). Dissertation, National Pedagogical Dragomanov University (2013)
4. Hurevych, R.S., Kademiia, M.Iu., Koziar, M.M.: *Informatsiino-komunikatsiini tekhnolohii v profesiinii osviti maibutnikh fakhivtsiv* (Information and communication technologies in the professional education of future specialists). LDU BZhD, Lviv (2012)
5. Hurzhii, A.M.: *Informatsiini tekhnolohii v osviti* (Information technologies in education). In: *Problemy osvity*, pp. 5–11. IZMN, Kyiv (1998)
6. Khazina, S., Ramsky, Y., Eylon, B.S.: *Computer modeling as a scientific means of training prospective physics teachers*. In: *8th International Conference on Education and New Learning Technologies (EDULEARN 2016)*, pp. 7699–7710 (2016). doi:10.21125/edulearn.2016.0694
7. Kiianovska, N.M., Rashevskva, N.V., Semerikov, S.A.: *The theoretical and methodical foundations of usage of information and communication technologies in teaching engineering students in universities of the United States*. *Vydavnychiy viddil DVNZ “Kryvorizkyi natsionalnyi universytet”*, Kryvyi Rih (2014)
8. Kiv, A.E., Semerikov, S.O., Soloviev, V.N., Striuk, A.M.: *First student workshop on computer science & software engineering*. In: Kiv, A.E., Semerikov, S.O., Soloviev, V.N., Striuk, A.M. (eds.) *Proceedings of the 1st Student Workshop on Computer Science & Software Engineering (CS&SE@SW 2018)*, Kryvyi Rih, Ukraine, November 30, 2018. *CEUR Workshop Proceedings* **2292**, 1–10. <http://ceur-ws.org/Vol-2292/paper00.pdf> (2018). Accessed 31 Dec 2018
9. Kolesnikova, I.A. *Osnovy andragogiki* (The basics of andragogy). Akademiia, Moscow (2003)

10. Kukharenko, V., Oleinik, T.: Open Distance Learning For Teachers. In: Ermolayev, V., Mallet, F., Yakovyna, V., Kharchenko, V., Kobets, V., Kornilowicz, A., Kravtsov, H., Nikitchenko, M., Semerikov, S., Spivakovsky, A. (eds.) Proceedings of the 15th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer (ICTERI, 2019), Kherson, Ukraine, June 12-15 2019, vol. II: Workshops. CEUR Workshop Proceedings **2393**, 156–169. http://ceur-ws.org/Vol-2393/paper_295.pdf (2019). Accessed 30 Jun 2019
11. Lukianova, L.: Motivation Factors of Adult Learning. *The New Educational Review* **44**(2), 223–230 (2016). doi:10.15804/tner.2016.44.2.18
12. Markova, O., Semerikov, S., Popel, M.: CoCalc as a Learning Tool for Neural Network Simulation in the Special Course “Foundations of Mathematic Informatics”. In: Ermolayev, V., Suárez-Figueroa, M.C., Yakovyna, V., Kharchenko, V., Kobets, V., Kravtsov, H., Peschanenko, V., Prytula, Ya., Nikitchenko, M., Spivakovsky A. (eds.) Proceedings of the 14th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer (ICTERI, 2018), Kyiv, Ukraine, 14-17 May 2018, vol. II: Workshops. CEUR Workshop Proceedings **2104**, 338–403. http://ceur-ws.org/Vol-2104/paper_204.pdf (2018). Accessed 30 Nov 2018
13. Markova, O.M., Semerikov, S.O., Striuk, A.M.: The cloud technologies of learning: origin. *Information Technologies and Learning Tools* **46**(2), 29–44 (2015). doi:10.33407/itlt.v46i2.1234
14. Modlo, Ye.O., Semerikov, S.O., Shmeltzer, E.O.: Modernization of Professional Training of Electromechanics Bachelors: ICT-based Competence Approach. In: Kiv, A.E., Soloviev, V.N. (eds.) Proceedings of the 1st International Workshop on Augmented Reality in Education (AREdu 2018), Kryvyi Rih, Ukraine, October 2, 2018. CEUR Workshop Proceedings **2257**, 148–172. <http://ceur-ws.org/Vol-2257/paper15.pdf> (2018). Accessed 21 Mar 2019
15. Modlo, Ye.O., Semerikov, S.O.: Xcos on Web as a promising learning tool for Bachelor’s of Electromechanics modeling of technical objects. In: Semerikov, S.O., Shyshkina, M.P. (eds.) Proceedings of the 5th Workshop on Cloud Technologies in Education (CTE 2017), Kryvyi Rih, Ukraine, April 28, 2017. CEUR Workshop Proceedings **2168**, 34–41. <http://ceur-ws.org/Vol-2168/paper6.pdf> (2018). Accessed 21 Mar 2019
16. Morkun, V., Semerikov, S., Hryshchenko, S., Slovak, K.: Environmental Geo-information Technologies as a Tool of Pre-service Mining Engineer’s Training for Sustainable Development of Mining Industry. In: Ermolayev, V., Bassiliades, N., Fill, H.-G., Yakovyna, V., Mayr, H.C., Kharchenko, V., Peschanenko, V., Shyshkina, M., Nikitchenko, M., Spivakovsky, A. (eds.) 13th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer (ICTERI, 2017), Kyiv, Ukraine, 15-18 May 2017. CEUR Workshop Proceedings **1844**, 303–310. <http://ceur-ws.org/Vol-1844/10000303.pdf> (2017). Accessed 21 Mar 2019
17. Morkun, V.S, Semerikov, S.O., Morkun, N.V., Hryshchenko, S.M., Kiv, A.E.: Defining the Structure of Environmental Competence of Future Mining Engineers: ICT Approach. In: Kiv, A.E., Soloviev, V.N. (eds.) Proceedings of the 1st International Workshop on Augmented Reality in Education (AREdu 2018), Kryvyi Rih, Ukraine, October 2, 2018. CEUR Workshop Proceedings **2257**, 198–203. <http://ceur-ws.org/Vol-2257/paper19.pdf> (2018). Accessed 21 Mar 2019
18. Morze, N.V.: Systema metodychnoi pidhotovky maibutnikh vchyteliv informatyky v pedahohichnykh universytetakh (Methodic system of Computer Science teacher’s training in pedagogical universities). Dissertation, National Pedagogical Dragomanov University (2003)

19. Nechypurenko, P.P., Semerikov, S.O.: VlabEmbed – the New Plugin Moodle for the Chemistry Education. In: Ermolayev, V., Bassiliades, N., Fill, H.-G., Yakovyna, V., Mayr, H.C., Kharchenko, V., Peschanenko, V., Shyshkina, M., Nikitchenko, M., Spivakovsky, A. (eds.) 13th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer (ICTERI, 2017), Kyiv, Ukraine, 15-18 May 2017. CEUR Workshop Proceedings **1844**, 319–326. <http://ceur-ws.org/Vol-1844/10000319.pdf> (2017). Accessed 21 Mar 2019
20. Oliinyk, V.V.: Vidkryta pisladyplomna pedahohichna osvita i dystantsiine navchannia v zapytanniakh i vidpovidiakh (Open postgraduate pedagogical education and distance learning in questions and answers). ASK, Kyiv (2013)
21. Petrova, M.Ye., Mintii, M.M., Semerikov, S.O., Volkova, N.P.: Development of adaptive educational software on the topic of “Fractional Numbers” for students in grade 5. In: Kiv, A.E., Semerikov, S.O., Soloviev, V.N., Striuk, A.M. (eds.) Proceedings of the 1st Student Workshop on Computer Science & Software Engineering (CS&SE@SW 2018), Kryvyi Rih, Ukraine, November 30, 2018. CEUR Workshop Proceedings **2292**, 162–192. <http://ceur-ws.org/Vol-2292/paper19.pdf> (2018). Accessed 21 Mar 2019
22. Rakov, S.A.: Matematychna osvita: kompetentnisnyi pidkhid z vykorystanniam IKT (Mathematical education: a competency approach using ICT). Fakt, Kharkiv (2005)
23. Rean, A.A., Bordovskaia, N.V., Rozum, S.I.: Psikhologiiia i pedagogika (Psychology and pedagogy). Piter, St. Petersburg (2000)
24. Semerikov, S.O., Shyshkina, M.P.: Preface. In: Semerikov, S.O., Shyshkina, M.P. (eds.) Proceedings of the 5th Workshop on Cloud Technologies in Education (CTE 2017), Kryvyi Rih, Ukraine, April 28, 2017. CEUR Workshop Proceedings **2168**. <http://ceur-ws.org/Vol-2168/preface.pdf> (2018). Accessed 21 Mar 2019
25. Semerikov, S.O., Teplytskyi, I.O., Yechkalo, Yu.V., Kiv, A.E.: Computer Simulation of Neural Networks Using Spreadsheets: The Dawn of the Age of Camelot. In: Kiv, A.E., Soloviev, V.N. (eds.) Proceedings of the 1st International Workshop on Augmented Reality in Education (AREdu 2018), Kryvyi Rih, Ukraine, October 2, 2018. CEUR Workshop Proceedings **2257**, 122–147. <http://ceur-ws.org/Vol-2257/paper14.pdf> (2018). Accessed 30 Nov 2018
26. Semerikov, S.O., Teplytskyi, I.O., Yechkalo, Yu.V., Markova, O.M., Soloviev, V.N., Kiv, A.E.: Computer Simulation of Neural Networks Using Spreadsheets: Dr. Anderson, Welcome Back. In: Ermolayev, V., Mallet, F., Yakovyna, V., Kharchenko, V., Kobets, V., Kornilowicz, A., Kravtsov, H., Nikitchenko, M., Semerikov, S., Spivakovsky, A. (eds.) Proceedings of the 15th International Conference on ICT in Education, Research and Industrial Applications. Integration, Harmonization and Knowledge Transfer (ICTERI, 2019), Kherson, Ukraine, June 12-15 2019, vol. II: Workshops. CEUR Workshop Proceedings **2393**, 833–848. http://ceur-ws.org/Vol-2393/paper_348.pdf (2019). Accessed 30 Jun 2019
27. Semerikov, S.O.: Teoretyko-metodychni osnovy fundamentalizatsii navchannia informatychnykh dystsyplin u vyshchyykh navchalnykh zakladakh (Theoretical and methodic foundations of fundamentalization teaching of the Computer Science at the high educational institutions). Dissertation, National Pedagogical Dragomanov University (2009)
28. Slovak, K.I., Semerikov, S.O., Tryus, Yu.V.: Mobilni matematychni seredovyshcha: suchasnyi stan ta perspektyvy rozvytku (Mobile mathematical environments: current state and development prospects). Naukovi chasopys Natsionalnoho pedahohichnoho universytetu imeni M. P. Drahomanova, Serii 2: Kompiuterno-orientovani systemy navchannia 12(19), 102–109 (2012)

29. Syrovatskyi, O.V., Semerikov, S.O., Modlo, Ye.O., Yechkalo, Yu.V., Zelinska, S.O.: Augmented reality software design for educational purposes. In: Kiv, A.E., Semerikov, S.O., Soloviev, V.N., Striuk, A.M. (eds.) Proceedings of the 1st Student Workshop on Computer Science & Software Engineering (CS&SE@SW 2018), Kryvyi Rih, Ukraine, November 30, 2018. CEUR Workshop Proceedings **2292**, 193–225. <http://ceur-ws.org/Vol-2292/paper20.pdf> (2018). Accessed 21 Mar 2019
30. Vopel, K.W.: *Wirksame Workshops: 80 Bausteine für dynamisches Lernen*. iskopress, Salzhausen (2006)
31. Zhaldak, M.I.: Problemy informatyzatsii navchalnoho protsesu v serednikh i vyshchyykh navchalnykh zakladakh (Problems of informatization of the educational process in secondary and higher educational institutions). *Kompiuter u shkoli ta simi* 3, 8–15 (2013)
32. Ziaziun, I.A., Kramushchenko, L.V., Kryvonos, I.F., Myroshnyk, O.H., Semychenko, V.A., Tarasevych, N.M.: *Pedahohichna maisternist (Pedagogical mastery)*. Vyshcha shkola, Kyiv (2004)
33. Zyazyon, I.A.: *Filosofiiia pedahohichnoi yakosti v systemi neperervnoi osvity (The Philosophy of Pedagogical Quality in the System of Continuous Education)*. *Visnyk Zhytomyrskoho derzhavnogo universytetu imeni Ivana Franka* 25, 13–18 (2005)