

Research findings relative to the use of leadership cloud services by Ukrainian teachers

Liudmyla Matviichuk

Faculty of Nature and Mathematics
Taras Shevchenko National University “Chernihiv Collegium”
53 Hetman Polubotko Street, 14013 Chernihiv
Ukraine
e-mail: matviychuk2012@gmail.com

Oleg Avramenko

Faculty of Technology and Pedagogics
Pavlo Tychyna Uman State Pedagogical University
2 Sadova Street, 2, 20300 Uman
Ukraine
e-mail: aaaooobbb3@ukr.net

Olga Dombrovska

Faculty of Technology and Pedagogics
Pavlo Tychyna Uman State Pedagogical University
2 Sadova Street, 2, 20300 Uman
Ukraine
e-mail: kseniya.a.o.04@gmail.com

Abstract Cloud technologies are integral to daily existence of many authorities as they are attractive by their immensity and virtualization of resources. Cloud services open up possibilities to be widespread in the education sector too. In addition, such services have become an integral feature for any modern teacher because of their large toolkit. This article discusses the research findings relative to the leadership cloud services using by Ukrainian teachers. This raises the question of modern technologies in teachers' use and which we so often hear about. The goal of research is to find out how common is the use of leadership cloud services in educational communities of Ukraine. With that in mind, the article defines the teachers' proficiency levels for leadership cloud services characterizing them as the “passive user” with the average awareness between men and women (42%), as the “active user” – (46%) and as the “expert” – (13%). The “active user”, as has been revealed, has the dominant proficiency level for cloud services. The main methodological toolkit of the study has been presented as the questionnaire “The Place of Leadership Cloud Services in the Organization of the Educational Process”. The study has been performed with the involvement of 169 teachers from Ukrainian educational communities. In general, respondents use cloud services to store data, to create presentations and interactive exercises. Respondents has shown their awareness of some cloud services like Prezi, SlideShare, or LearningApps, as they use them from time to time in their professional activities. Thus, the study has highlighted a number of pros and cons of cloud services using in the organization of e-learning (e-training). The selection of leadership cloud services herein is offered to improve the educational process. As a result, it is set forth forcibly the effectiveness of cloud technologies having been used by teachers in e-learning.

1 Introduction

Any learning activity of recent years has been significantly transformed. The process of organizing educational activities has undergone enormous changes. Students are increasingly becoming supporters of modern technologies, and forcing teachers to search, to develop and to implement electronic tools, resources and services. Actually, leadership cloud services become a good helper, thanks to which we can give another dimension to a normal student activity and transform classes into an interesting and productive process of transferring knowledge. Cloud technologies have occupied an important place in the organization of educational activities (Bora and Ahmed 2013; Tiutiunnyk and Honcharenko 2014). Therefore, the teachers must be able to understand, which services of these technologies should be exactly used to make students feel comfortable. That is the fact that such modern tools are popular among teachers as well as the usability potential of the above-mentioned cloud technologies by modern teachers is very high.

Some rapid pace of technology development generates pressure on the entire education sector, as to the provision of an appropriate level of educational services. At the same time, each educational community undertakes to provide students with the best conditions. Any school priority is to implement modern technologies in the scanty funding framework. To maintain the quality level of the educational process with all the necessary (methodological, software, technical support, etc.), the services of cloud technologies shall become useful for teachers. Such technologies attract all participants of the educational process with their significant advantages. The ability to work with modern technologies opens up more opportunities for students to accomplish the tasks they will meet now and in the future. The scale of cloud technologies is very serious, as it provides us with mobility, a wide range of tools that is so important students. Therefore, all the participants in the organization of the educational process should be able to use cloud products.

Despite the increased attention in the scientific community to the use of such technologies in educational activities, this issue remains insufficiently studied and requires much more empirical results. The goal of this paper is to find out how popular the use of leadership cloud services among teachers of the Ukrainian educational communities. The main objectives of this research are: i) to determine the teachers' proficiency levels for leadership cloud services; ii) to reveal the advantages and disadvantages of leadership cloud services in the learning process; iii) to offer leadership cloud services to improve the organization of the educational activities.

2 A concise literature review

In one interesting recent publication, Encalada and Sequera (2015) share their significant experience in their research paper, in which they accent our attention on the possibility of cloud technologies in the organization of computing laboratories, focusing on the combination of pooling of technological tools and activities in the cloud (Encalada and Sequera 2015). After pursuing own studies, Kasiolas (2017) has received positive data relative to the use of cloud technologies in teaching and learning in general. As a result, a students' polling has shown their positive attitude as well as their intention how to use cloud technologies in their future (Kasiolas 2017).

All in all, cloud technology services have a big impact on the traditional and e-learning process (Alharthi et al. 2015). Mhouti et al. (2016) have revealed the picture of the cloud computing impact on the e-learning process. Studied the urgent issues associated with the deployment of an e-learning system, they have given evidence of the cloud computing convenience for the e-learning process. They have commonly worked on the design of a virtual cloud network that facilitates and supports students in learning activities, as well as motivates them to complete their tasks (Mhouti et al. 2016). Many scholars share the common groundwork in the e-learning authorities that promote learning, encourage reflection, and build links between teachers and students (Conole and Unido 2013). Benta et al. (2014) give the first experience of using the e-learning platform to support individual learning in the academic field, which both confirms the effectiveness and increases the interest of students in laboratory activities (Benta et al. 2014).

E-learning changes the perception of the educational process, as well as helps to solve many daily issues of the educational activities, satisfying the priority needs of modern students. Cloud technologies are powerful tools not only for teachers, but also for students (Liao et al. 2014). In their research studies, the authors have confirmed that leadership cloud services are affordable, convenient, and encourage students to work (Piotrowski 2013). It should be noted that the introduction of leadership cloud services is relevant to all the participants of the educational process.

3 Research methods

The methodological tool for the study undertaking was a questionnaire designed to meet the present needs. The questionnaire has been developed for teachers. The questionnaire lasted from September 1, 2017 up to January 31, 2018. The research study has involved 169 respondents. The demographic data of the participants in the study group are presented in Table 1 below. The questionnaire has been sent out via modern communication systems like e-mail and social networks (LinkedIn, Twitter, Facebook, and Google+). The article presents the results of our research study. A tool for determining the teachers' proficiency level for leadership cloud services consisted of 14 questions. Based on the questionnaire, we have set the level of the "passive user", "active user", and the "expert". The questionnaire included open and close type of questions and questions with the involvement of Likert scale. Processing of the results was carried out according to the following scheme: initially – the processing of responses in questionnaires (sorting out rejected questionnaires); then – inserting data in a special form for computer verification; and finally – calculating the average values with the output evaluation. Using the methods of mathematical statistics, we provided insight into the data obtained.

Table 1. Participant Demographics

Gender (Teachers)	N	%
Male	52	31%
Female	117	69%
Grand Total	169	100%
Occupational Title		
Student-Teacher	13	7,7%
PhD Student	13	7,7%
School Teacher	26	15,4%
Teaching Assistant	6	3,6%
Senior University Lecturer	13	7,7%
Associate Professor	78	46,2%
Professor	20	11,8%
Grand Total	169	100%
Name Educational Communities		
Ivan Franko Zhytomyr State University	10	5,9%
Center “The Sun Drop”	1	0,6%
Central Ukrainian National Technical University	3	1,8%
Kyiv Secondary School No.232	3	1,8%
Donetsk NUET Kryvyi Rih City	4	2,4%
Vinnitsa National Technical university	6	3,6%
National Pharmaceutical University	2	1,2%
T. Shevchenko National University “Chernihiv Collegium”	100	59,2%
Petro Vaylenko Kharkiv National Technical University of Agriculture	6	3,6%
Pavlo Tychyna Uman State Pedagogical University	5	3%
Zaporizhzhia National University	1	0,6%
Oleksandr Dovzhenko Hlukhiv National Pedagogical University	3	1,8%
Mikhailo Drahomanov National Pedagogical University	12	7,1%
Ivan Ohiienko National University in Kamianetsk-Podilsk	1	0,6%
Sumy State Pedagogical University	6	3,6%
Izmail State Humanitarian University	6	3,6%
Grand Total	169	100%

Source: Own results

4 Research findings

Full-rate activities in the “cloud” is evenly provided in the form of levels: the *first level* is the hardware (equipment): databases, servers, and network equipment; the *second level* consists of software, more specifically with the software system (operating system) and applications for performing users’ interaction; and the *third level* is the interface that allows using various devices (smartphones, tablets, laptops, PCs, etc.) to access to the e-learning system (Bibi and Sumra 2017). It should be noted that such technologies are widespread in various service models, particularly, in *SaaS* (Software-as a Service) “the software as a service”; *PaaS* (Platform as a Service) “platform as a service”; *IaaS* (Infrastructure as a Service) “the infrastructure as a service”; *Daas* (Desktop as a Service) “virtual workplace as a service” (Mell and Grance 2011). The organization of the e-learning process via leadership cloud services for teachers is not difficult. Each teacher selects the necessary tools for productive work (teaching the course) in order to rise to a new teaching level.

After the evaluation of the foreign experience as to the e-learning implementation and the use of leadership cloud services, it can be argued about their important mission in the organization of the learning process. It should be noted that Ukrainian scholars have no less experience to organize the educational activities by attracting modern technologies, including the use of leadership cloud services (Tiutiunnik and Honcharenko 2014; Martynenko 2017).

One of the objectives of the study is to determine the teachers’ proficiency for leadership cloud services. To solve this problem, a survey was conducted among teachers of various educational institutions of Ukraine and the data on the use of leadership cloud services by teachers have been justified.

Therefore, the questions like “What cloud technologies are the most popular among teachers?”, “What are the modern teaching staff’s proficiency levels for them?” and others have been answered, and the results of which are given herein.

Given the popularity of modern communication systems, the survey has been conducted thanks to social networks and email. To begin with, we offer to find out the teachers’ attitude to the cloud technologies. The academic staff (169 respondents) took part in the survey. Among the respondents, the overwhelming number of them has belonged to the female audience – 117 people, and to male – 52 people. There were 46.2% of associate professors. The results of the survey are graphically shown in Figure 1.

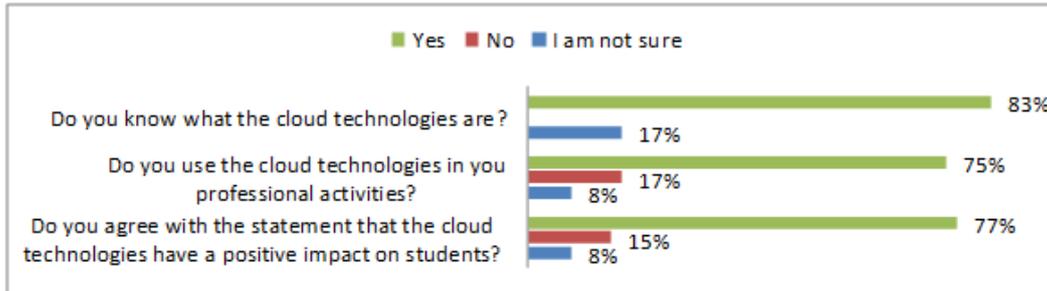


Fig. 1. The Teachers’ Attitude to Cloud Technologies
Source: Own results

Given the data obtained (Fig. 1.), prove the fact that teachers are clearly aware of cloud technologies. At the same time, they see such technologies as able to have a positive impact on the expansion of students’ horizons and increasing their interests in the course of study. Accordingly, it has been found that data storage services like Google Drive (64% of respondents), OneDrive (16%), Mega, JetlQ, OpenDrive, and Amazon Cloud Drive (4%) are the most popular among teachers. Only 4% of respondents have answered that they do not use cloud data storage services at all.

The happy medium of our research study is the validation of leadership cloud services given by the respondents herein. They rated the quality of cloud platforms, data repository and web services for educational purposes under a five-point scale (5 – fully promising, 4 – more promising than unpromising, 3 – more unpromising than promising, 2 – unpromising, and 1 – unfamiliar with technology). With certain moderation, the survey results sorted from promising to unpromising. The evaluation results are graphically shown in Fig. 2 and Figure 3 below.

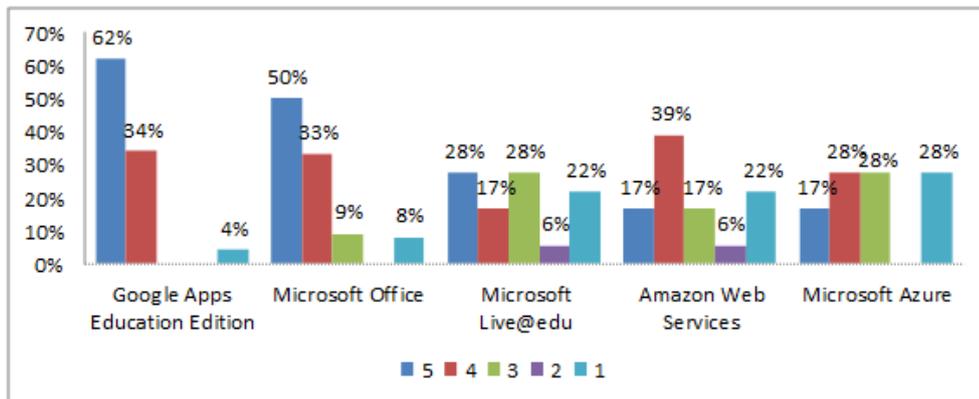


Fig. 2. Validation Results of Cloud Technologies and Platforms by Teachers
Source: Own results

The findings of the survey indicate that respondents have met or may have known about cloud platforms before. According to the validation of modern technologies, most teachers consider Google Apps Edu and Microsoft Office as the fully promising. This is because of the fact that teachers use these platforms as data storage in the form of the text – 93%; as the graphic image – 64%; and as a video – 56%. It is worth noting tha, there are also respondents, who are unfamiliar with the technology, namely, Amazon S3 and Ubuntu One – 35% of respondents among the respondents who evaluated the cloud for educational purposes. This fact is explained by the specific features of the range of services offered by manufacturers and additionally they are not in great demand among the teaching community now.

Having reviewed the results of the validation, we can say that leadership cloud services are still popular among teachers. Averagely, 52% of teachers rated the quality of applications in the educational process as “excellent” (Fig. 4). That is so. Leadership cloud services replace software, which is often absent, and therefore the implementation of full-fledged activity becomes impossible. They solve many problematic issues related to the educational process. Resources always have access to them at any time and from any device (one of the advantages). The unfamiliar with leadership cloud services averages as 13% of respondents. Such results are also good and in the future their use will be somewhat different (ubiquitous) in the educational process.

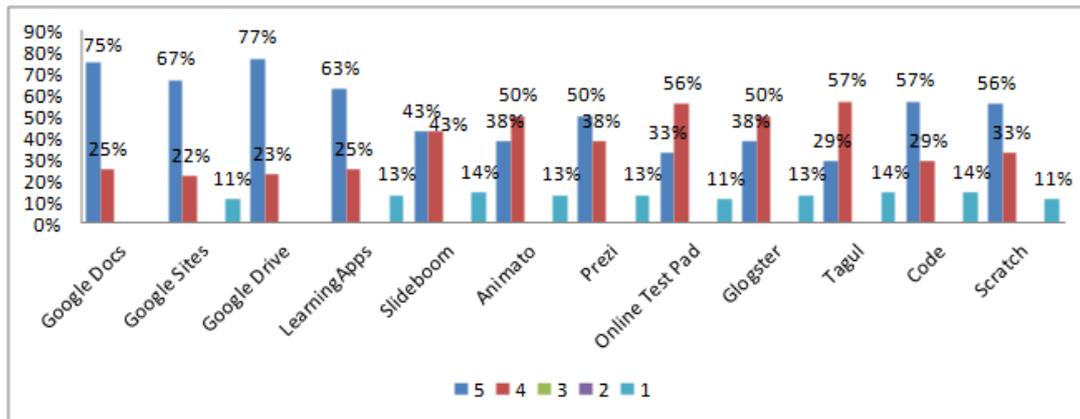


Fig. 3. Validation Results of Leadership cloud services by Teachers
Source: Own results

Based on the survey findings, Table 2 shows the results of the clarification of the teachers’ proficiency levels for leadership cloud services. Accordingly, these data, showing the proficiency levels, may be partly probabilistic in nature, because of the results depending on the respondents, their honest while giving answers in the process of filling out the questionnaire as they have been unknown for us.

Table 2. Proficiency Levels for Cloud Services

Respondents	Levels			N
	Passive User	Active User	Expert	
Men	33%	50%	17%	52
Women	50%	41%	9%	117
Grand Total				169

Source: Own results

Therefore, according to the survey data, the average value of proficiency levels for cloud services involving men and women is: the “passive user” – 42%, the “active user” – 46%, and the “expert” – 13%. The conclusive result shows that the majority of respondents knowing the cloud services at the level of the “active user” – 50% men and 41% women. The difference between men and women is insignificant. This is a good result.

Of course, when it comes to the use of cloud services considering a particular educational community, the results are not so good. Answering the question: “Do you use cloud services in the organization of the educational process?” the respondents (40%) have answered that they could not have used them yet because of difficulties. According to teachers, difficulties in the implementation of cloud technologies in the educational process involve a low speed or even a lack of the Internet, Wi-Fi, insufficient technical support, outdated equipment, teacher’s inactivity, the fact that not everyone is aware of the benefits of such cloud services. Additionally, it is the low computer literacy level among teachers, their conservatism, and the lack of motivation.

However, some teachers use leadership cloud services in their professional activities, mainly for the purpose to:

- store and exchange the textual information (speed and large volumes);

- create presentations (Prezi, SlideShare);
- develop interactive tasks (LearningApps);
- create mental maps (mindomo);
- optimize of any lecture material;
- carry out some on-line testing.

The advantages of using leadership cloud services in the organization of e-learning are:

- access to its content and infrastructure 24/7 from any device;
- unlimited data storage (mainly paid service);
- adaptability, mobility, convenience, speed, virtualization;
- independence from the operating system;
- access to many free services (programs);
- team work on the project;
- expenses reduced for licensed software (update);
- use of the infrastructure of other companies; the school does not invest any finances;
- non-necessity to make backups;
- easiness in data sharing with colleagues, and students;
- organization of modern classes;
- performance of tasks outside the education community;
- motivation of students to learn;
- communication of teachers with students;
- communication and e-mailing, e-journals, and repetitions.

Possible disadvantages involve the high tariff plan capabilities; the Internet addiction; most services are paid; small amount of free space; there is no proper information security and confidentiality, most English interface; and the teacher's ICT competence.

To improve the educational process organization, the teacher may use leadership cloud services selected (from the practical experience of this article authors) for:

- creating a platform for the implementation of e-learning process and placement of training resources – Eliademy, Google sites, Blogger, Wix.com.;
- making interactive exercises – Tagul.com, Tagxedo.com tag cloud; PurpozeGames, Online Test Pad, Classtools.net, GeoDartGame, Jigsaw Planet, Learning Apps, Educaplay, Toolsforeducators;
- creating a video lab instruction – GoView (goview.com), screencast-o-matic (screencast-o-matic.com) Screenr (screenr.com);
- preparing tests – Online Test Pad Master Test, Examtime, QuizWorks, Quizzy, Knowledgelevel, Test_fromgamel, Usaura;
- structuring educational material (smart maps, knowledge maps) – FreeMind, mindomo, spiderscribe, bubbl.us; and other services helpful for teachers – to *create presentations*: SWAY, Google presentations, Prezi, Animoto; to *create bookmarks*: Diigo and Bobr Dobr; to *post the timetable of classes on the site*: Google Calendar; to *design interactive posters*: Glogster, ThingLink; geoservices: Google Maps, WikiMapia, Google Earth; to *make up questionnaires*: Google forms, Online Test Pad, Kahoot, Flisti, QuizSnack, Poll-maker, Simpoll.

5 Discussions

Based on survey findings, it is fair to say that teachers are mostly aware of leadership cloud services, but they do not know how to use them effectively on an individual basis. That is also evidenced by the results of foreign studies (El Mhouti et al. 2018), the lack of knowledge and teachers' motivation.

Comparing research findings from Fernández et al. (2012), some contradictions have been found. However, as a result, the researchers have proposed the cloud-based effective approaches to the e-learning process, which may significantly change the organization of the educational activities.

Respondents considered the Google Apps (57.9%) as the promising cloud technology for educational purposes among others, because of the Google having provided many useful free services for teachers and students. In general, the study underlines the useful and helpful capabilities of cloud technologies and services in the organization of the educational process, providing great benefits to students and teachers. After the verification based on the research findings (Attaran et al. 2017), and on the prospects of leadership cloud services, the researchers confirm the potential benefits of clouds in the educational environment. They highlight

the successful introduction of leadership cloud services into the training of two universities: the first one is “Roger Williams University located in Bristol, R.I.” and the second one – “Bryant University, a private New England University”.

Leadership cloud services deprive the educational institutions of the software and hardware burden. The teachers’ motivation to use modern technologies remains major for the organization of the educational process. Since only a few really use the powerful potential of leadership cloud services. In addition, these technologies are a modern teacher’s valuable tools and an interesting means of delivering on any target for students.

6 Conclusions

Overall, our results stemming from the undertaken research study allowed us to establish that the level of the “active user” dominated among other proficiency levels for leadership cloud services among teachers. Despite the significant differences in the opinions of respondents, leadership cloud services are promising in the e-learning organization.

According to the survey, the GoogleApps is a promising cloud technology among teachers in comparison with other simultaneous technologies. The respondents have argued their choice grounding on its useful, interesting, and free services, and as a result – 57.9% of teachers actively use them in their work. The teacher, organizing the educational process, developing tools and resources for the use of leadership cloud services, does not lose own qualification level, remains an innovator, develops, goes ahead of further innovations updating knowledge. Therefore, in accordance with the requirements of our time, it is very important to develop a creative approach in the future for specialists in solving problems and in their creativity without any limitation of the traditional tool set.

Thus, the use of leadership cloud services in the organization of the e-learning process has the most positive opportunities despite its disadvantages. However, they are practically insignificant against the background of advantages. Moreover, they do not much interfere with the work in organizing modern classes. Leadership cloud services, well established from the teachers’ practical experience, have been offered as the helpful means for all the modern teachers.

References

- Alharthi A, Yahya F, Walters R.J, Wills GB (2015) An Overview of Cloud Services. Adoption Challenges in Higher Education Institutions 1:102–109. doi: 10.5220/0005529701020109
- Attaran M, Attaran S, Celik BG (2017) Promises and challenges of cloud computing in higher education: a practical guide for implementation. *Journal of Higher Education Theory and Practice* 17(6): 20-38
- Benta D, Bologaa G, Dzitaca I (2014) E-learning platforms in higher education: case study. *Procedia Computer Science* 31:1170–1176. doi: 10.1016/j.procs.2014.05.373
- Bibi G, Sumra I A (2017) A Comprehensive Survey on E-Learning System in Cloud Computing Environment. *Engineering Science and Technology International Research Journal* 1(1):43–50
- Bora UJ, Ahmed M (2013) E-learning using cloud computing. *International Journal of Science and Modern Engineering* 1(2):9–12.
- Conole G, Unido R (2013) Los MOOCs como tecnologías disruptivas: Estrategias para mejorar la experiencia de aprendizaje y la calidad de los MOOCs. *Revista de La Educación a Distancia* 1:16–28
- El Mhouthi A, Erradi M, Nasseh A (2018) Using cloud computing services in e-learning process: Benefits and challenges. *Education and Information Technologies* 23(2):893-909. doi: 10.1007/s10639-017-9642-x
- Encalada WL, Sequera JLC (2015) Collaboration in the Cloud for Online Learning Environments: An Experience Applied to Laboratories. *Creative Education* 6:1435–1445. doi:10.4236/ce.2015.613144
- Fernández A, Peralta D, Herrera F, Benítez JM (2012) An overview of e-learning in cloud computing. In: Uden L, Corchado Rodríguez E, De Paz Santana J, De la Prieta F (eds.) *Workshop on learning technology for education in cloud (LTEC'12)*. *Advances in intelligent systems and computing*, Berlin-Heidelberg: Springer, 173 p.
- Kasiolas V (2017) The use of cloud computing technologies in teachers’ education and training. *Sborník příspěvků z mezinárodní studentské odborné konference Olympiáda techniky Plzeň*, pp. 84–88

- Liao J, Wang M, Ran W, Yang SJ (2014) Collaborativecloud: a new model for e-learning. *Innovations in Education and Teaching International* 51(3):338–351. doi:10.1080/14703297.2013.791554
- Martynenko NO (2017) The Relevance of the "Cloud" Services Implementing in the Educational Process *Economics. Management. Business* 4 (22):160-166
- Mell P, Grance T (2011) The NIST definition of cloud computing. Recommendations of the National Institute of Standards and Technology. doi.org/10.6028/nist.sp.800-145
- Mhouti A, El Erradi ANM, Vasquèz JM (2016) Cloud-based VCLE: A virtual collaborative learning environment based on a cloud computing architecture. *International Conference on Systems of Collaboration (SysCo)*, pp. 1-6
- Piotrowski DM (2013) Cloud Computing as Network Environment in Students Work. The 21st International BOBCATSSS Conference. <https://repozytorium.umk.pl/handle/item/575> Accessed 29 April 2019
- Tiutiunyk AV, Honcharenko TO (2014) Use of Cloud Services to Create an Educational Environment for a Teacher and a Student. *Training and Logical Discourse* 1:227-241