Cloud Computing for University Students' Language Learning

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Abstract: In this article the impact of cloud computing has been shown and the empirical analysis of the effectiveness of the Quizlet service for students has been conducted. The research purpose is to study the cloud computing influence on professional foreign language learning for university students' vocabulary development. The range of research methods (theoretical, empirical, and statistical) has been used to reach the research purpose and justify the research findings. To check the effectiveness of applying the Quizlet service in foreign language learning the empirical methods such as testing (written), observation were used as well as the pedagogical experiment, conducted with the law students. The statistical method helped to evaluate the results of the pedagogical experiment. A lot of vocabulary flashcards for the Quizlet service were created by the authors to develop law students' legal vocabulary in English classes. Their activities and tasks include Flashcards (tasks: Match, Translate, Click card to see the definition), Learn (task: Match every term and definition correctly two times to finish), Write (task: Type the answer in English), Spell (task: Type what you hear), Test (tasks: Written questions, Matching questions, Multiple choice questions, True/False questions). The results of pre-test and final test in the experimental group proved the effectiveness of cloud computing for university students' vocabulary development.

Keywords: *Cloud computing; the Quizlet service; language learning; vocabulary; university students.*

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1. Introduction

1.1. The research problem

The modern world is characterized by the rapid development of cloud computing. It penetrates all spheres of life and is actively used in various fields of human activity. The increasing cloud computing applying is also inherent in higher education. Among many diversities of cloud computing, undoubtedly, cloud computing in education is especially promising. It can equally and effectively be used both for applying distance learning and traditional classroom activities, diversifying it with non-standard, creative, gaming virtual tasks and virtual activities such as webinars, internet conferences, virtual classes etc. Moreover, today global IT companies (Microsoft, Google, Facebook and others) are developing cloud computing learning content that allows education using it.

1.2. The previous studies

The applying cloud computing for education is being explored around the world. The research analysis of the subject has shown that the scientists' works on cloud computing in education can be divided into two approaches. The first one deals with cloud computing in general, namely, how it is built and which service models it can have (Sarathy, Narayan, Mikkilineni, 2010), how it works (Rayport & Heyward, 2009; Thomas, 2011; Palaniappan, 2014), which problems may appear when it is used in the classroom and which advantages it can have (Gill, 2006; Plummer, Cearley, Smith, 2008; Abdullahi, Salleh, Alwan, 2018). The first approach examines as well the peculiarities of applying particular cloud computing such as Google apps (Herrick, 2009), multimedia 'Prezi' (Shim & Lee, 2018), social networks (Haouta & Idelhadi, 2018), gamification websites (Khaleel, Wook, & Ashaari, 2018) etc.

The second approach is devoted to interactive teaching methods and using an interactive whiteboard as a mean of cloud computing in foreign languages classes at different education stages. For example, scientists investigate use of an interactive whiteboard in education in general (Schmid & Whyte, 2012), the interactive whiteboard effectiveness for school students (Glover & Miller, 2002; Glover & Miller, 2006), for university students (Holubnycha & Shatrava, 2017), some difficulties of interactive whiteboard applying (Al-Faki & Khamis, 2014), some interactive whiteboard peculiarities for different ages (Aflalo, Zana, & Huri, 2018; Kostikova, Gulich, Holubnycha, & Besarab, 2019).

1.3. The research purpose

The research purpose is to study the impact of applying cloud computing in professional foreign language learning on university students' vocabulary development as one of the types of pedagogical technologies, which is actively implemented in public education.

2. Methods

For studying the essence of the problem the theoretical methods of the research such as analysis and synthesis of the previous studies have been used. For conducting the experiment the empirical (diagnostic) methods such as testing (written), observation, and pedagogical experiment have been applied. The statistical methods have helped to evaluate the experiment results.

The pedagogical experiment was conducted during 35 weeks (1 lesson (90 minutes) per week) in the 2018/19 academic year on the basis of Yaroslav Mudryi National Law University at The Institute of Prosecution and Criminal Justice and The Institute of Staff Training for Bodies of Justice of Ukraine (Kharkiv, Ukraine) and H. S. Skovoroda Kharkiv National Pedagogical University at Law Faculty. The experimental group included 120 first-year students, and the control group also included 120 first-year students.

3. Theoretical backgrounds

3.1. Applying cloud computing in education

Applying cloud computing in education can be considered as an up-to-date step in education, because it makes education affordable, giving everybody an equal access to education, regardless of whereabouts, social status and financial position. Cloud computing makes information resources accessible to both teachers and students through high-speed computer networks, providing Internet users with access to the computer resources of the remote server and to the software as an online service. The above became possible due to the main characteristic of cloud computing, which is to distribute and process remotely, and save data.

This specificity of cloud computing made it attractive and opened a number of advantages for its applying in the field of education. It is possible to identify a significant number of its various positive features, which are essential for the educational sector. Let's consider only those, which, in our opinion, are the main ones.

1) *Accessibility and mobility*, firstly, there is no need for powerful computers, any smartphone or mobile device gets huge opportunities if you open a browser window. And secondly, a specific workplace is not unnecessary; instead of this a student or a teacher can work from any place not only in a university, or in a hostel, but also anywhere. All this leads to the fact that the educational environment becomes more open for both students and teachers.

2) *Cost-effectiveness* is reducing the cost of software as all programs required by a user are provided by a service in which the applications will work, and on its updates.

3) *High-performance and flexible*, which, firstly, allows storing unlimited data, secondly, has high data processing speed. And thirdly, it allows performing successfully various types of learning activities.

4) *Reliability*, it provides a certain level of security both from viruses and from advertising, and provides the protection of users' data from losses that can occur when they are saved on their own hard disk.

In addition, it is convenient for teachers to customize the software for their own needs, creating and accumulating a database of learning content that can be adjusted quickly if necessary. Another advantage is the ability to exchange a task bank with colleagues. Students, in turn, can apply cloud computing to prepare better for classes, study at home. At the same time, their level of motivation to study is significant, the opportunity to increase time to work over the certain skills leads to improved learning outcomes.

One more reason for applying cloud computing in learning is the fact that there are already various cloud services in the modern market that offer teachers wide creative and method opportunities for finding the effective ways of teaching, and motivating students to study. It also allows them to reduce time and money, and organize learning as best as possible.

3.2. Analysis of cloud computing for foreign language learning

An analysis of existing cloud services that is useful in foreign language learning has shown that they can be divided into several groups:

1. Services for creating multimedia presentations. Among the various online services, *Prezi*, *The SparcolVideoScribe*, *Moovly*, *GoAnimate*, and *PowToon* deserve attention. *Prezi* allows providing a presentation with a single interactive field with the ability to bring the desired item at the right moment. *The SparcolVideoScribe*, *Moovly*, *GoAnimate*, or *PowToon* services help to create scribing, which is a dynamic, animated presentation-video with a hand drawing that enhances students' attention to learning content.

Multimedia presentations in foreign language classes can be used for the development of linguistic and speech competencies.

2. Services for creating local images. So, infographics help to structure and visualize educational content in the form of diagrams, and graphs. It is convenient for more rapid perception, for example, English grammar or vocabulary. For the stated purpose, it is expedient to use online services *Visual.Ly*, *Easel.Ly*, *Piktochart* or *Infogr.am*. *Mind map* which look like a diagram, allow teachers to capture the basic ideas, thoughts or plan, point associated with a specific learning topic, and thus can develop different competencies well, eliminating the additional difficulty of keeping in memory a lot of information. For online work in a group teachers can use *Cacoo* or *Bubbl.us*. If a student group prepares a learning content in which they want to insert sounds, videos, labels or drawings, it is convenient to use *Mindomo* or *Popplet*.

3. Services for creating interactive pictures. The idea of the *ThingLink* service is to work interactively with the learning content by adding information to pictures using links. To intensify interactive activities and attract most students' attention teachers can use animation learning pictures. Today there is a significant number of sites with similar pictures. It is important to note that this service provides ready-made collections of learning pictures on various subjects, as well as the ability to create quickly own interactive learning pictures.

Flashcard allows teachers to fill in interactive learning cards with images, words and phrases, texts, links, and even sounds. The service offers interactive games for couples (student – student, student – teacher), and for a group of students, shuffling randomly the questions put to the pictures. The online service is useful both for learning new vocabulary and for revising it.

Another service that develops vocabulary effectively in an interactive form is *Quizlet*. Created by ourselves flashcards with terms, phrases or other active vocabulary are tucked in with translations or definitions to them. The service offers several options for interactive games and ready-made thematic collections as well.

One more online service for learning a foreign language *Study Stack* has proven well for learning vocabulary. By creating a set of questions and answers, terms and their definitions, a teacher has several options for interactive games through the service.

In addition, there are ready-made task collections that can be used to teach students. There is also a wide range of opportunities for learning a

foreign language with the online service *GoCongr*, which is suitable both for creating flashcards, for reading texts, and for mind mapping.

4. Services for playing education games. Various services such as *LearningApps.org*, *JigZone*, or *Photograph Puzzle* or *Zondle* allow teachers to create crossword, puzzles, quizzes and so on that can be used to teach English.

5. Testing services. To conduct a survey of various forms from the questionnaire to the test, and even check it the online services *Online Test Pad*, *Simpoll* may be used.

In our experiment, we chose the *Quizlet* service, which was tested with students.

4. Results

4.1. The experiment basis

The pedagogical experiment was aimed at determining the impact of applying cloud computing (the *Quizlet* service) in English classes to develop students' professional legal vocabulary, demonstrating service effectiveness. Measuring the experiment results was made by assessing the vocabulary level in experimental and control groups.

During the experiment the students learned English as usual with textbooks, mastering all language aspects and all kinds of English activities, that is, they read, wrote, listened, and talked using professional legal vocabulary. However, the students in the experimental group were also provided with the legal vocabulary tasks developed by the authors with the *Quizlet* service, access for the experimental group: <https://quizlet.com/365483135/module-1-modern-legal-systems-flash-cards/>.

Consequently, the vocabulary level was checked before and after the pedagogical experiment. The basis for its checking was the fluent use of professional legal vocabulary, terminology, and context.

The pre-test lasted 90 minutes and was aimed at checking vocabulary. It included such tasks as *Match*, *Fill in the gaps*, *Choose the correct variant* etc.; reading comprehension tasks for short legal texts as authentic ones as adapted ones to check vocabulary as well.

As a basis for checking vocabulary level, a standard (in Ukraine) 12-point scale was used, in which 1-3 points are unsatisfactory, 4-6 points are satisfactory, 7-9 points are good, 10-12 points are excellent.

Thus, the students' previous vocabulary level of experimental and control groups was determined with the pre-test they performed at the

beginning of the experiment. Comparing the pre-test and final test results allowed us to evaluate the effectiveness of applying the *Quizlet* service for the vocabulary development.

As we have already mentioned, during the experiment, the students of the experimental group made systematically a variety of vocabulary tasks using the *Quizlet* service. They included such activities and tasks as *Flashcards* (tasks: *Match*, *Translate*, *Click card to see the definition*), *Learn* (task: *Match every term and definition correctly two times to finish*), *Write* (task: *Type the answer in English*), *Spell* (task: *Type what you hear*), *Test* (tasks: *Written questions*, *Matching questions*, *Multiple choice questions*, *True/False questions*).

The system of tasks, devoted to developing legal vocabulary, was created by the authors on the basis of online *Quizlet* service and was performed by students in the classroom with the help of an interactive whiteboard, and in extra-curricular work, during students' self-study with the help of their personal gadgets.

4.2. The proposals

Let's analyze our experimental work. There is no doubt that interactive tasks in the *Quizlet* service contributed developing students' vocabulary. The authors created a variety of flashcards (with legal terms or phrases, as well as translations or definitions to them) according to the curriculum topics studied in the pedagogical experiment.

An example of created flashcards for tasks *Match*, *Translate* in 'Flashcards' is shown in Fig. 1.

Figure 1. A created flashcard for tasks *Match*, *Translate* in 'Flashcards'

An example of created flashcards for the task *Match each term and definition correctly two times to finish* in 'Learn' is shown in Fig. 2.

Figure 2. A created flashcard for the task *Match every term and definition correctly two times to finish* in 'Learn'

An example of created flashcards for the task *Type the answer in English* in 'Write' is shown in Fig. 3.

Figure 3. A created flashcard for the task *Type the answer in English* in 'Write'.

An example of created flashcards for the task *Multiple choice questions* in 'Test' is shown in Fig. 4.

Figure 4. A created flashcard for the task *Multiple choice questions* in 'Test'

The *Quizlet* service also offers students two types of interactive games "Gravity" and "Match". The interactive game "Gravity" has several levels of difficulty depending on the falling speed of the 'meteorites' (flashcards) with the legal terms or phrases that need to be translated in time.

An example of created flashcards for the interactive game "Gravity" is presented in Fig. 5.

Figure 5. A created flashcard for the interactive game "Gravity"

The interactive game ‘Match’ was used both at the lessons and for homework. The purpose of the task was to find matches (legal terms and their definitions or translations) as soon as possible. In addition, it is very important that a teacher is able to track from his smartphone who and how often made the exercises, as well as students’ results.

An example of created flashcards for the interactive game ‘Match’ is shown in Fig. 6.

Figure 6. A created flashcard for the interactive game ‘Match’

At the end of the experiment we compared the results of pre-test and final test as for vocabulary development.

4.3. The result analysis

The summarized results of the experiment of both pre-test and final tests have been demonstrated through changes in vocabulary development by testing. They are reflected in the level diagrams in the experimental and control groups.

The experimental group results are presented in Fig. 7.

Figure 7. The results in the experimental group

Thus, the diagram analysis in the experimental group shows, firstly, all students improved their results; secondly, most students reached the good level (7-9 points) and excellent level (10-12 points), the number of students with the satisfactory level (4-6 points) decreased significantly.

In our opinion, such results are related to the effective applying the cloud service (the *Quizlet* service) that promoted an individual approach to learning, increased students' interest, motivation and enlarged the time that students devoted to develop English vocabulary.

The experiment has shown that tasks such as *Match*, *Translate*, *Type the answer*, *True / False questions* were the best in practicing words and phrases for vocabulary development. It is no doubt that applying the cloud service has contributed to the development of students' vocabulary. In addition, the students have demonstrated a creative focus in practising interactive quizzes in the *Quizlet* service.

The results in the control group are presented in Fig. 8.

Figure 8. The results in the control group

The diagram analysis in the control group shows that, firstly, not all students demonstrated increased vocabulary. In our opinion, this is due to the fact that the final test was more complicated, because we thought that in 35 weeks all students had to make some progress; and secondly, the achieved increase in the vocabulary development is very small. We strongly believe that it is connected with the fact that the students of control group did not practise in the *Quizlet* service.

5. Discussion

According to the analysis of the scientists' studies, cloud computing is really effective for foreign language learning. The study of gamification websites (Khaleel, Wook, & Ashaari, 2018), the case study of Facebook in online social networks (Haouta & Idelhadj, 2018), cloud computing design in teaching and learning (Chao, 2012), cloud computing in writing class (Wang, 2017) have shown the positive impact of these cloud services on students' motivation to foreign language learning, their confidence in language skills and competencies, as well as their satisfaction and interest to English learning.

The researchers also noted the interaction growth, the perception improvement of the learning content, engagement, and feedback. The experiment results of applying cloud computing in foreign language classes

showed that students in the experiment pointed that it was more interesting for them to learn, they enjoyed classes, felt the benefits of foreign language learning, improved their skills and intended to learn a foreign language further (Herrick, 2009; Thomas, 2011).

However, our research was mainly aimed at finding out the impact of cloud computing, basically, the *Quizlet* service on professional English lessons focusing on students' vocabulary development.

Consequently, the results of the experiment confirmed that the regular use during 35 weeks of cloud computing, namely the *Quizlet* service, for English classes both in the classroom and for homework, really increased students' vocabulary development in the experimental group.

6. Conclusions

Thus, the experimental study about applying cloud computing, namely, the *Quizlet* service, in professional English classes has confirmed its influence on vocabulary development. It proves the effectiveness of the service in particular, and cloud computing in general for students' learning. Today, applying cloud computing for students' learning can be considered as the effective learning tool that promotes the vocabulary development, increasing students' interest and motivation for learning, and opening up new opportunities for both students and teachers.

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