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Original article

M-LEARNING AS A TEACHING TOOL TO ENHANCE LANGUAGE COMPETENCE FOR UNIVERSITY STUDENTS

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Abstract. Mobile learning is currently becoming an integral part of education process at various higher institutions. A thoughtful selection of appropriate ML applications as well as their proper usage in the education process is sure to increase language competence among students studying foreign languages at a university and boost their motivation level. Thus, a good mobile app should meet the following requirements: an opportunity to invite classmates, friends, other group members and chat with them in a foreign language solely; to send feedback to mobile app developers and other users; interface in a foreign language; an opportunity to work with different types of multimedia files and other materials in the application. In compliance with the mentioned requirements, we have chosen the following mobile apps: Puzzle English, Lingua Leo, Duolingo, Busuu, Words and Memrise. The purpose of our research is to attempt to prove that the use of ML-technologies today enables to improve the key aspects of language learning (reading, writing, listening). Moreover, as the results of our research indicate, it is also able to raise students' motivation level and the degree of satisfaction with their study process.

Key words: *m-learning, language competence, mobile applications, motivation, education technologies*

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Научная статья

МОБИЛЬНОЕ ОБУЧЕНИЕ КАК ИНСТРУМЕНТ ПОВЫШЕНИЯ ЯЗЫКОВОЙ КОМПЕТЕНЦИИ СТУДЕНТОВ ВУЗОВ

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Аннотация. Рассматривается использование мобильных приложений для изучения иностранного языка студентами технических специальностей. Цель исследования — попытка доказать, что использование ML-технологий позволяет значительно усовершенствовать основные навыки владения иностранным языком у студентов технических специальностей: лексико-грамматические навыки, навык чтения, аудирования и письма. Как показывают результаты исследования, такие технологии способны повысить уровень мотивации студентов и степень их удовлетворенности процессом обучения.

Ключевые слова: мобильное обучение, языковые компетенции, мобильные приложения, мотивация, образовательные технологии

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Introduction

The rapid changes that take place in education today are the result of the development of information and computer technologies that have influenced all aspects of human life. It is obvious that many educational institutions are in search of a universal model of teaching based on innovations, which will help to build the most effective educational process and increase the motivation of students to the learning process. The effectiveness of foreign language learning is thought to be mainly determined, firstly, by the intensity of motivation of students, secondly, by the quality and content of the educational process and, finally, directly by the psycho-physiological characteristics of the student. One of such innovations is mobile technologies, so-called m-learning, which many researchers consider to be the part of the technologies of electronic education (e-learning). In the modern world it is impossible to ignore the fact that mobile devices provide a promising platform for the development of a new direction in learning a foreign language. At the moment there are about 1.5 billion mobile devices in the world, which is three times more than the number of traditional computers in use. The first papers devoted to the research of the use of mobile devices in the classroom as a teaching tool appeared in early 2000, for instance in works of Garner [Garner, Francis, Wales, 2002]. That year Stone also stated that mobile phones steadily assumed a place in higher education in the USA and Britain [Stone, Briggs, 2002]. Some later studies considered using mobile phones to deliver education content for learning literature [Hoppe, 2004].

Apps for mobile devices are already used in many European countries, as well as in the USA, Australia, and Canada, where they are considered to be an integral part of any language course. Evans believes that “mobility and accessibility are key benefits of the M-learning process”. The use of the Internet can be considered a “pedagogical tool to improve learning effectiveness” [Evans, 2008, p. 492]. WEB 2.0 resources, namely blogs, podcasts, wikis, social networks, messengers, video conferencing have proved the effectiveness of new technologies in education. It is common knowledge today that the use of mobile technologies can result in different learning approaches and increase motivation of students [Aagaard, 2015]. In Russia, however, examples of this kind of training are still few, especially in Higher Education Institutions, and, according to the estimates, development in this area lags behind by 5-7 years.

Despite the relative novelty of ML (mobile-learning) technology (the first prototypes of mobile applications began to appear about 20 years ago), the scientific literature contains numerous attempts by researchers to define the concept of ML. When analyzing the materials concerning this field in detail, it was found that all definitions either refer to the technological parameters of the used learning tools or point to the general didactic aspects of ML. Some foreign authors, when specifying the definition of ML, emphasize their attention to the technological parameters - features of the used mobile means and technologies. Mobile learning is considered to be a technology that uses mobile wireless devices as a teaching tool: smartphones, tablets, the pace of development and distribution of which is rapidly developing. The study process encompasses space, time and involves interaction

with special technologies such as mobile devices [Kukul'ska-Hulme, 2009], Y. V. Eremin and Y. A. Krylova define mobile learning as “new education and information reality” [Eremin, Krylova, 2014, p. 159]. Other linguists point out that ML should be defined as electronic education regardless of its time and place using mobile devices with special software on the basis of module approach [Markova, Wilson, Stumpf, 2012]. The term mobile learning covers the personalised, connected and interactive use of handheld computers in classrooms [O'Malley, Stanton, 2002] in collaborative learning [Pinkwart et al., 2003], in teacher-training [Seppala, Alamaki, 2003] and in counseling and guidance [Vuorinen, Sampson, 2003]. Traxler defines mobile learning as “any educational provision where the sole or dominant technologies are handheld or palmtop devices” [Traxler, 2005, p. 261].

The subject of our research is determined by the fact that traditional approaches to teaching a foreign language become outdated, therefore they need to be changed and adjusted to increase the motivation of language learners. Implementation of m-learning technologies are bound to help, according to many teachers and researches. Neglecting modern technologies can lead to the loss of interest among students. There are also some problems arising. One of them is that despite a considerable amount of mobile applications at the moment there are still few which prove to be user-friendly, effective and motivating.

In our paper we have also made an attempt to review the most commonly spread mobile apps for learning English and identify their advantages and drawbacks in terms of training students at industry faculties. The purpose of our research is to understand whether proper introduction and use of the most advanced mobile applications are able to increase the effectiveness and results of foreign language learning. We also aim to find evidence that m-learning application may raise students' motivation and enhance their satisfaction with the studies as well as to give clear guidelines to teachers who regularly use them in the classroom.

Methodology

To achieve the purpose of the research we need to weigh the cons and pros of implementing mobile application in education process in general and suggest the way of eliminating the identified cons. It is also of primary importance to specify didactic properties and motivational force that analyzed mobile apps should possess. For this purpose we presented a detailed review of the most popular mobile apps and their functions in the Results section of this article. The following step of our research is to develop the set of activities using mobile apps to improve the language competence and skills of the English language learners and to assess the productivity and efficiency of the developed activities.

In the Discussion section we also presented the guidelines and tips of how to use specified apps in a more productive way. In our research we applied the following methods - diagnostic methods such as observation in the classroom, entry testing (to identify the students' level at the beginning of the course), experiments - to conduct diagnostic testing in order to assess the results of mobile apps implementation in the study process. Both quantitative and qualitative methods have been used to collect data and analyze the results of the experiment respectively.

The experimental part of the research included two groups of first year students studying in the second term at the faculty of Machine-Building Technologies at Don State Technical University. The experiment was carried out during their normal classroom activities within the framework of their General English Course, which is taught in their first year of study. We have chosen the second term students intentionally as we have realized that after entering the university students

need time to get used to a new environment and higher education requirements, as well as cope with the stress and anxiety of the first weeks/months of study. Both groups were tested and made up in accordance with the results of the tests so that the level of participants was virtually the same. Thus, it will allow us to draw a clearer conclusion about the efficiency of the applied methodology. The number of students constituted 20 people in each group. The age of participants ranged from 18 to 20 years old. The gender was – 75 % - female, 25 % - male. The first group was taught conventionally during the whole second term. It meant applying traditional textbooks, workbooks, audio recordings, photocopiable materials, dictionaries, video materials but without mobile apps. The second group included all the above-mentioned elements plus several mobile apps that we have selected after analyzing the group of the most common apps available in our region. At the end of the course both groups were given a questionnaire to estimate their satisfaction and level of motivation. Finally we have comprised the end-of-term test to assess the results of application of different approaches (traditional and that including ML components) in both groups. The entry and end-of-term tests consisted of similar parts to provide an unbiased approach to the assessment.

Research and its Results

Mobile apps selection and functions review

At the first stage of our research we aimed to select particular mobile apps, which could be incorporated in the learning process. Not only should the selected apps possess universal functions, but they are also supposed to serve as a motivational tool for users. A good mobile app should have positive influence on learner's inner motivation provided that its functions correlate with “three steps ladder” - interest - goal setting - success. It means that a mobile app should have such functions as:

- an opportunity to invite classmates, friends, other group members and chat with them in a foreign language solely;
- an opportunity to send feedback to mobile app developers and other users;
- interface in a foreign language;
- an opportunity to work with different types of multimedia files and other materials in the application.

All functions have to reflect basic didactic principles in education such as: activity, availability, visualization, awareness.

The algorithm of work with the application should correspond to the stages of foreign language vocabulary learning, which means that the application should use both verbal and non-verbal methods of semantisation of new lexical units (LU) under study, as well as a well-designed vocabulary and exercises for practicing the use of LU. If the application is developed to improve another aspect of the language, its functionality should also correspond to the features and stages of work inherent in the given language activity. The mobile application should also meet the needs of the users, i. e. its target audience. In compliance with the mentioned requirements we have chosen the following mobile apps: Puzzle English, Lingua Leo, Duolingo, Busuu, Words and Memrise.

Now we can formulate a general list of recommendations in terms of usability, design, interactivity and other conditions in this area:

- user-friendly interface;
- the ability to search for specific material;
- the ability to save progress, including in automatic mode;

- the possibility to design the application in the style that is in demand and popular with the target audience.

The Table 1 presents the comparative analysis of the didactocentricity and functional completeness of each of the chosen mobile app, which helps to gain a clearer understanding of the picture in the market for mobile language learning applications.

Functional analysis of mobile apps

Table 1

N	Function	Puzzle English	Lingua Leo	Duolingo	Busuu	Words	Memrise
1	Goals setting	-	+	+	-	+	+
2	Analysis of goals	-	-	+	-	+	+
3	Game-based tasks	+	+	+	+	+	+
4	Statistics	+	+	+	+	+	+
5	Reviews	+	+	+	+	-	+
6	Tasks variety	+	+	+	+	+	+
7	Multimedia	+	+	-	-	-	-
8	Interface	-	-	-	+	-	-
9	Level choice	+	+	-	+	-	+
10	Tips	+	+	+	-	+	-
11	Vocabulary	+	+	-	+	+	-
12	Chat in English	-	-	-	+	-	-
13	Autosave	+	-	-	+	-	+
Total +:		9	9	7	9	7	8

Experimental part

At the beginning we have selected 40 students with approximately the same level of English. The students were later divided into two separate groups consisting of 20 people each. Group 1 (traditional methods) and Group 2 (using ML). They were given an entry test, which showed that the average level of students being tested corresponded to level B1/B1+ according to Common European Framework of Reference (CEFR). The entry test comprised 4 parts (Part 1 - Vocabulary and Grammar, Part 2 - Reading, Part 3 - Listening, Part 4 - Writing). Speaking was excluded from our tests. Below are the results of entry testing for both groups (Table 2).

Entry test score for both groups in %

Table 2

Part of the test	Group 1 (traditional)	Group 2 (ml)
1 - Vocabulary & Grammar	76	75
2 - Reading	68	68
3 - Listening	73	72
4 - Writing	66	63
Total average score	70.75	69.5

Subsequently during the whole term the first group of students was taught in accordance with the existing syllabus and by means of traditional teaching methods including textbooks, workbooks, audio recordings, photocopiable materials, dictionaries, video materials. The second group (experimental) was taught by

complementing traditional approach with the selected mobile apps. Both groups had the same number of classes throughout 4 months of the second term (twice a week). Homework was set correspondingly, that is the assignments for the second group involved an opportunity to use selected mobile apps. At the end of the term both groups were given identical final tests including four parts (Vocabulary & Grammar, Reading, Listening, Writing). The results of both groups are shown in the Table 3.

Table 3

End-of-term test score for both groups in %

Part of the test	Group 1 (traditional)	Group 2 (ML)
1 - Vocabulary & Grammar	76	81
2 - Reading	71	71
3 - Listening	72	73
4 - Writing	67	71
Total average score	71.5	74

As Table 3 shows the results in the first part of the test (Vocabulary & Grammar) have improved significantly (by 5%), which allows us to draw the conclusion that using mobile apps helps students to remember words, word combinations and collocations better. They are also more likely to understand how to select words depending on the context of the sentence, paragraph or the whole text. Moreover, the results of the first part indicate that m-learning methods provide students with good grammar practice, which means they apprehend grammar rules well and are able to use them correctly. Selected mobile apps do really have a variety of grammar exercises that cover and train most aspects of English grammar. As to the second and third parts of the test (Reading and Listening respectively) we have not witnessed any big changes in the results, which probably shows that m-learning does not give any advantage in terms of reading and listening skills improvement. Although the third part results slightly increased, it does not give any hard evidence proving the effectiveness of ML-technologies. The results of the Writing section, however, indicate obvious improvement. Using mobile apps means students are engaged in typing letters and words most of the time. Thus, they are highly likely to improve their spelling and punctuation. They simply come across with a written word on a more frequent basis. Chat-rooms are comfortable settings where students talk “by writing to each other”. Therefore, we assume that it probably also contributes to the raise of the literacy level.

Of course, we do not possess enough data and grounds to claim that it is m-learning technologies only that helped us to increase the results in the experimental group. Traditional methods of teaching do remain a vital part of the whole teaching process. Subsequently, it would be more appropriate to talk about an effective combination of both approaches that enables us to increase the student's level.

Finally, we have attempted to make an assessment of students' motivation and satisfaction with the course. To do so, we applied descriptive and comparative statistics on the overall satisfaction with the study based on the work of K. Jedvaj and V. Skrbinjek [Jedvaj, Skrbinjek, 2022].

According to the Table 4 we see that the number of students satisfied with the course (either partially or completely) in the first group comprises 65%, which accounts for two-thirds of the total amount of the respondents, whereas the num-

ber of satisfied respondents in the second group makes 80%, which accounts for more than three-quarters of all the responses. There are also more neutral opinions among the students in the first group, while the number of those who are dissatisfied is virtually the same.

Table 4

Overall satisfaction level

Answer	Group 1 (percentage)	Group 2 (ml) (percentage)
Completely dissatisfied	3	2
Partially dissatisfied	6	6
Neutral	26	12
Completely satisfied	30	38
Partially satisfied	35	42
Total	100	100

To test out the hypothesis that using mobile technologies might increase students' motivation we have asked the students in both groups whether they would choose to do a similar course again (Table 5).

Table 5

Descriptive statistics on whether students would study again

Answer	Group 1 (percentage)	Group 2 ml (percentage)
Yes	78	86
No	22	14

Table 5 shows that in both groups the number of the respondents wishing to take the similar course again is significantly higher. However, the numbers in the second group allows us to conclude that m-learning technologies might better encourage students to study further. Of course, it does not mean that traditional ways of learning are an ineffective tool for motivation. On the contrary, as the results of the survey show they do remain a powerful method to promote further education and to increase motivation level.

In order to get good results while using mobile applications in English classes it is of primary importance to implement them properly into an education process and organize it in the way that will enable teachers to make up for all drawbacks and problems that such technologies might pose. The problems arising fall into two categories: technical (slow Internet access, poor equipment in classrooms, etc.) and psychological (students perception of mobile apps usage, development of "clip thinking" as a result of frequent use of gadgets). Most educational institutions nowadays have already solved the first technical problem as most classrooms have comfortable setting and quick Internet access. Students are normally allowed to bring their own devices and use them freely. Moreover, a great deal of Higher Educational Institution promote BYOD (Bring your own device) policy, thus encouraging learners to use their own devices. Currently there are a number of papers dedicated to BYOD issues at work [Mohd Shukry et al., 2013] and at school [Afreen, 2014]. It is also worth mentioning that psychological comfort, feeling of ownership and habit are beneficial. In addition to it, "private devices" are often more advanced and productive than those given at work or at a place of study. Psychological problems demand special knowledge from the teacher. It is common knowledge that younger students might perceive a mobile device as a toy. Conse-

quently, they lose concentration and get easily distracted which definitely decreases the effectiveness of ML-technologies. To cope with this problem we suggest restricting time of mobile app usage (15-20 min per normal class lasting 45 minutes). To slow down “clip thinking” it is necessary to vary activities done via mobile apps and to combine them with traditional methods. Complementing m-learning with case study tasks or role games is sure to increase motivation and raise interest. Monotonous and similar tasks are to be avoided. Students often misuse mobile apps which hinders the development of communication skills. “Blind” use of online-translators hinders the abilities to translate texts and narrows students vocabulary. Therefore, students ought to be guided how to use m-learning technologies wisely and effectively.

It should be emphasized again that m-learning is not the main education tool but an additional means which has a potential to enhance results only when applied appropriately in accordance with students’ needs. The results of our experiment gave evidence that m-learning tools are able to increase students’ language competence. Although we have tested them among students of industrial specialties, they might also be used in other spheres of study.

In our paper we also aimed to identify the level of students motivation and satisfaction with the course. We believe that the implementation of m-learning technologies does increase the interest of students and gets them involved in the study process more intensely. We realize that satisfaction is a key element to study. It is also reflected in motivation to study better and further, which is also essential for positive perception of Higher Educational Institutions. Dissatisfied students are much likely to drop out or change their course of study, while spreading negative criticism of the educational institution and the study course [Alves, Raposo, 2007]. Dissatisfaction with the course will surely lead to the lack of motivation and result in bad exam scores and poor career prospects. Motivation is often determined by the psychological state of a person. Grum and Musek define it as “psychological process that motivates and directs our behaviour” [Grum et al., 2009]. Motivation is a key to success in education [Gilbert, 2013]. Student satisfaction is an important element of their self-identification and sense of belonging, which has an impact on their academic studies [Fan, Luchok, Dozier, 2021].

Conclusion

Nowadays it is becoming more evident that technological development promotes the appearance and implementation of new educational technologies and methods. In our hypothesis we claimed that implementation of mobile technologies in educational process for industrial sector students will allow us to not only increase their language competence but will also boost their motivation and satisfaction with the study process. Moreover, we managed to achieve our goals by creating an opportunity for students to communicate with native speakers and to improve all aspects of language learning (reading, writing, listening). Another advantage of using m-technologies in classroom is that we save costs: mobile apps contain a plenty of additional activities and exercises. There is also no need to redesign classroom or supply it with new costly equipment. Throughout our research we have analyzed functionality of the most common mobile apps on the market today and have selected the most functional to be applied in the classroom environment. The end of course tests that students took at the end of the term showed the improvement of overall results in most aspects of language study. We have also witnessed that students improved their technical skills of m-learning application,

which is sure to help them in further development and encourage to try new innovative approaches in education, AI and neural networks, for instance.

The survey carried out at the final stage of our research has also demonstrated an increase in motivation and satisfaction level among students taking part in the experiment. Thus, the developers of m-learning apps should take into consideration the motivation factor. It means that the app ought to include options, which directly influence students' psychological perception and satisfaction with what they do. However, the results of the test have also indicated that we cannot neglect traditional approaches in education either. We are convinced that electronic and mobile means are still unable to replace existing methods and the most effective results can be achieved by the proper combination of using them both.

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