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MOBILE LEARNING INTEGRATION AMONG TEACHERS OF ENGLISH AS A FOREIGN LANGUAGE

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Abstract:
Unstoppable and constant advances in technology affect the inevitable changes in the ways and methods of teaching, but also changes in different students' learning needs. New generations of students are characterized by mobility and because of that the information is very easily accessible, which requires the implementation of new trends in the educational process. One of these trends is mobile learning, which is available to young people everywhere and at any time 24/7. Therefore, it is scientifically and pedagogically justified to research the implementation and evaluation of such a new useful education tool in facilitating foreign language teaching. Mobile learning combines all forms of learning which refer to mobile devices and wireless internet. Such learning with the help of modern technologies would make it easier for students to acquire new knowledge, and at the same time to improve and to accelerate their personal and social development. Due to the various opportunities provided by mobile learning, the complexity of its implementation and implementation in teaching English as a foreign language increased almost exponentially. It has become particularly obvious in times of uncertainty such as the implementation of distance learning instead of traditional classroom teaching due to a sudden pandemic around the world. Although mobile learning is very often taken for granted because it is considered a disruptive factor in foreign language teaching (Aldrich, 2017), the affirmative attitude about mobile foreign language learning (MALL) (Zhang, Cristol, 2017) has become increasingly prevalent. The paper analyzes the results of a survey of English language teachers in primary and secondary schools in Osijek-Baranja County, which is one of the 21 counties in the Republic of Croatia, on attitudes toward mobile learning obtained from a sample of 121 participants. They point that the use of digital media in teaching is changing didactic and methodological methods and approaches to learning English, especially in secondary education. There is a lack of research on multimedia-didactic structuring of mobile learning in foreign language teaching in Croatia, this research will contribute to a better

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understanding of this issue but also offer possible solutions for designing innovative methods in teaching English from the aspect of mobile learning.

Keywords: mobile learning, English as a foreign language, mobile devices

1. Introduction

The unstoppable and constant progress in technology also affects inevitable changes in the ways and methods of teaching and learning. Technology definitely is a catalyst for change, but the educational system institutions should consider how digitization will make teaching more efficient and effective in the future (Higgins et al., 2012). We have to take a look at the issue of using ICT in education from an informatics point of view, but even more from a didactic-methodical point of view. Currently, research into the role of new technologies in education is one of the most recent and frequent research areas in pedagogy (Topolovčan et al., 2017). Functional possibilities of digital technology in teaching offer: 1) simultaneous, multimedia, and multimodal digital visualization, transmission, and storage of teaching content; 2) carrying out activities using digital technology that until recently was exclusively manual and 3) digitally mediated (a personal) communication (Kanselaar et al., according to Topolovčan, 2022).

New generations characterized by mobility and to whom information is very easily accessible, demand new trends in the educational process. One of these trends is mobile learning, which is available anywhere and at any time of the day. Mobile learning implies the use of mobile technology in education (Gedik et al., 2011; Oller, 2012). We can observe the potential benefits of mobile learning through process economization, communication benefits, learning assistance, motivational component, and availability – of service at the point of use (Cheon et al., 2012; Ganesan, Raja, 2019). Therefore, it is scientifically and pedagogically justified to investigate the implementation and evaluation of mobile learning in teaching, especially in foreign language teaching. Such learning through modern technologies would make it easier for students to acquire new knowledge, and at the same time improve and accelerate the personal and social development of students.

In accordance with the constant changes in the world, especially in the new technological age, there are also changes in the teaching process of a foreign language. The author Kukulska-Hulme (2009) believes that they are in addition to formal education, everyday opportunities to access learning resources on mobile devices have also increased significantly. For example, when you want to improve your knowledge of a foreign language, it is possible very easily, you just need to find resources for downloading applications and websites that can be accessed at the moment ("on the go"), but in practice, questions like prices and usability of such self-initiated mobile learning.

Prensky (2001), who was among the first to write about mobile devices in teaching, emphasizes that sometimes mobile phones are even more powerful than other, more advanced technologies and that their potential should be used to achieve educational outcomes. Furthermore, he emphasizes that students are "native speakers" of the digital

language of computers, video games, and the Internet, and therefore calls them "digital natives". The generation of digital natives also includes the alpha generation, which consists of individuals born after 2010. The challenge facing the educational system is adaptation to ways of interacting with members of the alpha generation. All co-constructors of educational policies and practices should interdisciplinary take care of the individual needs of today's (but also the future's) students, as well as the needs of society, and by accepting both segments, think through and create the future's educational system (Jukić, 2021). The year "Alpha" was born in 2010 and coincides with the launch of the iPad and Instagram - currently the most popular social media application. Opposite of them there is the generation of teachers that Prensky (2001) calls "digital immigrants", who need to fundamentally change their approaches to modern school and adapt their teaching process using modern didactic tools, one of which is precisely the smartphone as an indispensable part of mobile learning. Author Lisana (2023) claims that the adoption of technology by users is one of the most important contributions to the success of that technology. Therefore, the success of mobile learning (ML) depends on the very acceptance of the students of the alpha generation. Further, according to Tlili et al. (2022), this means that it is the members of the Alpha generation who were born in a society that is completely digitized with the Internet, smartphones, and virtual reality and are parallel in the world of augmented reality technology. Generation Alpha who was born between 2010 and 2025 is special because that specific generation only started appearing around 2011 and didn't join formal education until 6 years later, which is around 2017. Even after they were included in formal schooling, their education was soon interrupted by the COVID-19 pandemic, which forced their education on the Internet. Stavert (2014) defines mobile learning as an activity carried out using a didactic tool such as a mobile device with Internet access, which can also serve as support for learning.

As Motiwalla (2007) argues, the reason why mobile learning systems may not be widespread in education is the growing concern among teachers about the sustainability of such devices in the teaching process due to doubts about their usefulness in education compared to traditional teaching approaches. The biggest obstacle to introducing mobile learning into the teaching process is teachers' fear of distraction and undesirable forms of student behavior (UNESCO, 2012). Sharples et al. (2009) believe that with technological progress and increasing digitization of content, we have the possibility of designing learning in a different way: connecting people in the real and virtual world, creating learning communities between people on the move, providing expertise, and supporting lifelong learning. To understand how people learn through mobile, pervasive, and lifelong interaction with technology.

2. Mobile learning in the Croatian curriculum reform

With the development of technology, students have been given the opportunity to research on their own, find certain information and acquire knowledge through independent work, and mobile learning is introduced in schools after the curricular

reform under the name School for Life, and therefore it is important to focus on teachers who should apply mobile learning. At the same time, the use of all this should be adapted to the age, abilities, and interests of the student, that is, to his emotional and cognitive experience, prior knowledge, and language content (Miljević-Riđički et al., 2000). Teaching in a modern school is a dynamic process because the teacher creates the education process collaboratively with his students and has the role of moderator, that is, leader of the lesson, which means that the teacher should use well-designed activities and methods to encourage students to learn actively (Matijević and Radovanović, 2011).

2.1 Mobile learning in teaching English as a foreign language

Teaching a foreign language as a very dynamic and communication-oriented process which enables the application of mobile learning at multiple levels, has become especially evident within formal, non-formal, and informal learning approaches, where the non-institutional approach to learning foreign languages is increasingly dominant (Eaton 2011, Johnson and Majewska, 2022). English as a modern *língua franca* (a language that largely transcends the borders of the country where it is spoken) is taught all over the world today, which requires teachers of English as a foreign language to adapt to modern forms and methods of teaching and learning and to the needs of new generations of students, regardless of their geographical positioning and additional professional and vocational education. At the same time, it is extremely challenging for teachers to follow new trends in the use of mobile learning, especially in the teaching process of English as a foreign language, because new tools such as mobile applications on smart portable devices are multiplying at an exponential rate.

It turned out to be especially demanding to face the many challenges of distance learning during the pandemic caused by the Covid-19 virus, and accordingly, teachers need exceptional support and help in creating and shaping it. In this period, the use of computers and the Internet has become an indispensable part of teaching activities, but the availability of mobile applications has made it possible to move away from simply downloading materials from the Internet, presentations and text handouts that simply imitate traditional activities in the school classroom, but through their digital versions. Mobile applications for mobile phones allow students to access multimodal materials that combine image, sound, and text (e.g., Kahoot, Canva, Actionbound), which makes the teaching of English as a foreign language more dynamic, interactive, and inclusive for students, which implies a higher level of application of collaborative learning as an important change from traditional approaches to learning. These arguments are based on the author's own experience (Svalina, 2022), but therefore this research attempted to take the first step in that direction, and the goal of this research was to investigate the application of mobile learning in the teaching of English in primary and secondary schools in Croatia.

How smartphones, mobile phones, and tablets not only allow individuals to learn whatever they want and whenever it suits them but also in many cases create opportunities for collaborative learning, in which students communicate with each other and work together to complete a task or solve an issue, Kukulska-Hulme and Viberg

(2018) investigated mobile collaborative learning studies, published between 2012 and 2016, with the aim of understanding the use of mobile technologies to support collaborative second and foreign language learning practices. Since mobile collaboration involves physical co-location and separation of collaborators in time and place, they came to the conclusion that the pedagogical approach to a foreign language is dominated by a combination of individualized and collaborative learning and situated and communicative language learning and some of the advantages of such learning are timely feedback, personalization, socialization, self-evaluation, active participation, peer coaching, outdoor sources of inspiration and cultural authenticity.

Research among students who studied English as a foreign language also showed positive attitudes toward mobile learning. The experiment was conducted in two groups of ten students each - a test group and a control group. The experimental group learned traditionally with the addition of mobile learning, while the control group only had a traditional approach to the teaching process. At the end of the experiment, even 60% of students answered that mobile learning can be useful to a certain extent, and 25% completely agreed. The experiment proved that a mobile device can be used not only for entertainment and communication but also as a learning tool, as part of creativity in the teaching process of teaching English (Kuimova et al., 2018). Thus, mobile phones, which are always available without any obstacles, can turn educational institutions into centers of learning, different authors dealing with mobile learning describe mobile learning in different ways. Although the mentioned authors state different explanations, they agree on the key meaning, which is that mobile learning offers different activities and learning opportunities in new ways, emphasizing access and interaction in different contexts.

Thus, Harris (2001) defines mobile learning as learning with the help of mobile devices and Internet access that provides experiential learning "everywhere, everywhere", and Grosso as the possibility of accessing any information and the possibility of using mobile technologies (Korucu, Alkan, 2011: 1925). Kukulska-Hulme (2005) believes that mobile learning is related to student mobility, in the sense that a person can access learning whenever he wants and wherever he wants, without any spatial or time limitations. It is about learning that is spontaneous, personal, informal, transferable, available everywhere and so integrated into everyday life that we hardly notice it.

Mobile learning is considered a potential pedagogical benefit because it affects the improvement of student motivation, achievement, and communication, and as technologies continue to develop, so does the potential for learning, but teachers should think about limiting and proper use of mobile devices in classrooms, which should be beneficial students (Baydas and Yilmaz, 2018; Sullivan et al., 2019). It offers different activities and learning opportunities in new ways, in terms of access and interaction, as well as individualized learning, for example listening or speaking (Kukulska-Hulme and Shield, 2008). In contrast, Bartelsen claims that mobile learning is nothing new because if a student in the middle of the 20th century took a textbook on the road and studied while traveling, then it was "*mobile learning*" (Bartelsen, 2011). The above statements show that the understanding of the term mobile learning is currently not uniform. For better

understanding and clarity. The use of the term mobile learning within this working document at this time requires a deliberate definition and understanding of the term as open as possible: mobile learning implies learning using mobile computing and telecommunications technology, provided that pre-prepared teaching-learning content, specially adapted for mobile devices, is used. In addition, many theorists define mobile learning as the ability to share information through mobile technologies. Mobile learning is actually electronic learning that has been "enhanced" and takes place through communication via mobile devices, and its most important characteristic and main advantage is that it can take place anytime and anywhere. This is actually the fundamental difference between e-learning and m-learning.

When it comes to mobile devices, according to the definition from the Croatian Encyclopedia (2020): "*A smartphone is a mobile phone with a touch screen that can be used as a pocket compute*[ii]*r. It appeared on the market in 2007. It often contains various measuring sensors, for example, an accelerometer and a gyroscope that enable automatic rotation of the screen, a magnetometer acts as a digital compass, and a light meter enables automatic adjustment of screen brightness*." According to Traxler (2009), mobile devices are included in a wider social transformation not only for students but also for other people because they distribute information, images, ideas, and opinions, which is why learning is redefined. Kukulska-Hulme and Traxler (2019) believe that the use of these devices is generally accepted within formal education. For proper use in the teaching process, it is important to recognize the potentially huge impact of the daily use of mobile phones and other personal technologies on the experiences and expectations of students before and during formal education. For this reason, the teacher should recognize the influence of everyday informal mobile learning as an ever-present alternative to formal education, at least from the student's point of view.

How smartphones, mobile phones, and tablets not only allow individuals to learn whatever they want and whenever it suits them but also in many cases create opportunities for collaborative learning, in which students communicate with each other and work together to complete a task or solve an issue, Kukulska-Hulme and Viberg (2018) investigated mobile collaborative learning studies, published between 2012 and 2016, with the aim of understanding the use of mobile technologies to support collaborative second and foreign language learning practices. Since mobile collaboration involves physical co-location and separation of collaborators in time and place, they came to the conclusion that the pedagogical approach to a foreign language is dominated by a combination of individualized and collaborative learning and situated and communicative language learning and some of the advantages of such learning are timely feedback, personalization, socialization, self-evaluation, active participation, peer coaching, outdoor sources of inspiration and cultural authenticity.

Research among students who studied English as a foreign language also showed positive attitudes toward mobile learning. The experiment was conducted in two groups of ten students each - a test group and a control group. The experimental group learned

ii http://www.enciklopedija.hr/Natuknica.aspx?ID=41427

traditionally with the addition of mobile learning, while the control group only had a traditional approach to the teaching process. At the end of the experiment, even 60% of students answered that mobile learning can be useful to a certain extent, and 25% completely agreed. The experiment proved that a mobile device can be used not only for entertainment and communication but also as a learning tool, as part of creativity in the teaching process of teaching English (Kuimova et al., 2018). Thus, mobile phones, which are always available without any obstacles, can turn educational institutions into centers of learning.

When it comes to researching the current state of mobile device use and mobile learning in secondary vocational schools in three countries of the European Union - Austria, the Czech Republic and Germany, the authors Biloš, Turkalj, and Kelić (2017) came to the conclusion that the majority of participants agreed on the advantages of using mobile learning, namely: simpler access to teaching materials, more knowledge about the topic they are studying and increased communication with other students. Furthermore, their study confirmed that students are most attracted to mobile learning applications during the teaching process, followed by learning applications such as video games for self-study and that students use forums and social networks as forms of information exchange and communication as joint learning. In the context of the use of mobile learning in the Republic of Croatia, there has been no extensive research until now, except for the attitudes of students of vocational schools in the Osijek-Baranja County towards the use of information technologies in teaching (Svalina, Ivić, 2020).

Matijević, Topolovčan, and Rajić (2017) for teaching in a multimedia digital environment, adapted to the needs of modern students, the so-called "net-generation", consider extremely important the motivation for using digital media and the teacher's ability to organize constructivist learning (and learning activities). Namely, unlike the traditional school, which is more focused on the cognitive skills of the students, the modern school respects the students' learning styles and multiple intelligences, using active learning methods, modern technology, and different sources of knowledge. Teaching in a modern school is a dynamic process in that the teacher builds collaboratively with the students, and he has the role of the moderator of the lesson with designed activities and methods he encourages the student to learn actively (Matijević, Radovanović, 2011).

As education is no longer designed for a group of students located in a defined context, teachers are faced with the challenge of designing lessons focused on the individual, through their own devices, which is why they must adapt to new challenges and inventive ways of teaching. Furthermore, it is very important that teachers are aware of the importance of approaching each student as an individual and adapting the teaching activity to each student separately. In this sense, the four design keys mentioned should be considered - design of content, activities, community, and communication. However, some limitations are stated - teachers themselves control the outcome as well as the design of the content (when they design it themselves), but not the activities or communication, especially when learning takes place outside classrooms or within closed learning environments. This is exactly why teachers have to think about current

pedagogical strategies, how they look at technology, and how they define spaces intended for learning. Ultimately, the paradigm shift will help students increase their learning outcomes and thus their achievements (in this sense, the four design keys mentioned should be considered - design of content, activities, community, and communication) (Sharples et al. (2009); Kukulska-Hulme (2009)).

3. Research methodology

3.1 Research goal

The aim of this research is to examine the attitudes of English language teachers about mobile learning and to research the use of mobile learning in teaching English as a foreign language in primary and secondary schools in Osijek-baranja county, Croatia.

3.2 Hypotheses

H1: Mobile learning as a teaching method is more often used in secondary schools than in primary schools. There is no difference between secondary vocational schools and gymnasiums.

H2: There is no difference in the frequency of application of mobile learning in teaching in rural and urban areas.

H3: There is a positive correlation between the frequency of using a mobile device in private life and the frequency of using mobile learning in English language classes - teachers who use a mobile device more often in their private life also use it more often in English language classes.

H4: Most of the teachers believe that they did not get enough knowledge about the application of mobile learning in the teaching of English.

H5: Teachers who have attended additional training in the field of mobile learning use this method more often in class and have more positive attitudes towards mobile learning than teachers who have not attended such training.

3.3 Method

3.3.1 Participants

121 English language teachers from the Osijek-baranja county which is one of the 21 counties in the Republic of Croatia participated in the research. The participants are employed as English language teachers in primary and secondary schools, which includes classroom and subject teaching in the primary school system and vocational schools and gymnasiums in the secondary education system (out of the total number of respondents, 5% of teachers work in classroom teaching, 49.6 % in subject teaching, 28.9% of teachers in secondary vocational schools and 16.5% in gymnasiums). There were 118 female and 3 male participants. The average age of the participants is 40.31 (SD=8.303), with an average work experience of 14.76 years (SD=7.916). 66.9% of the respondents teach English in urban areas, while the remaining 33.1% teach English in rural areas.

3.3.2 Instruments

For the purposes of this research, a survey was created that collected several types of data: demographic data (gender, age, length of service, and the type of school where the participant works); data on self-assessment of the frequency of using a mobile device in private life for 17 different activities (on a four-point Likert scale: never - rarely - occasionally - often); data on self-assessment of the frequency of using a mobile device in English language teaching (mobile learning) through 7 different possibilities of using a mobile device for this purpose (on a four-point Likert scale: never – rarely – occasionally – often); data on acquired knowledge about mobile learning during studies and through additional education; data on teachers' attitudes about mobile learning (which were researched through 11 statements that the participants evaluated on a 5-point Likert scale, from "strongly disagree" to "strongly agree"). The total score on the variable "Frequency of use of mobile devices in private life" is the sum of assessments (in the range from 1-never to 4-often) on 17 particles. A higher score indicates more frequent use of mobile phones in private life. The total result on the variable "Frequency of application of mobile learning in classes" is the sum of assessments (in the range from 1-never to 4-often) on 7 particles. A higher score means more frequent use of mobile devices in classes. The total score on the variable "Attitudes towards mobile learning" is the sum of the assessments (on a scale of 1 to 5) of 11 particles, with 3 particles being recorded due to the opposite direction of meaning. A higher score means more positive attitudes toward mobile learning in class. The survey was designed on the basis of professional literature and previously conducted research on a similar topic.

3.3.3 Procedure

The research was conducted online, in such a way that the survey in an online form (Google Docs) was shared into several closed groups on social networks that gather English language teachers from all over the Republic of Croatia. Participation in the research was voluntary and anonymous, and filling out the survey took about 10 minutes. Answers were collected during May 2021, after which appropriate statistical processing was carried out in the SPSS program.

4. Results

In order to test the first hypothesis, whether teachers use mobile learning as a teaching method equally often in primary schools (classroom and subject teaching), secondary vocational schools, and gymnasiums, a one-way analysis of variance was conducted for independent samples. The sample is divided into three groups - teachers who teach English in primary schools, teachers who teach English in secondary vocational schools, and teachers who teach English in gymnasiums. Descriptive statistics for all three mentioned groups are shown in Table 1, and the results of a simple analysis of variance are shown in Table 2.

Table 1: Descriptive statistics for the variable of frequency of application of mobile learning in classes for three groups of participants - English language teachers employed in primary schools, vocational secondary schools and gymnasiums

	Type of school	N	M	SD
Frequency of application of mobile learning in teaching	Elementary School	66	17.91	5,675
	Vocational school	35	20.66	4,988
	Gymnasium	20	20.80	4,595
	Total	121	19,18	5,459

Legend: N – number of participants in each group; M – arithmetic mean; SD – standard deviation

Table 2: Final table of simple analysis of variance for independent samples

A source of variability	ZK	df	A.D	F
Between groups	235,460	2	117,730	4,159*
Within groups	3340,540	118	28,310	
Total	3576,000	120		

Legend: ZK – sum of squares; df – degrees of freedom; PK – mean square; F – F-ratio; * the result is significant at the 5% risk level

A simple analysis of variance showed that there was a statistically significant difference between the groups (F=4.159, df=2;118, p<0.05), and an LSD post hoc test was performed to determine between which groups the difference was found. The post hoc test showed that there is a statistically significant difference between teachers who teach in primary schools and teachers who teach in secondary vocational schools - teachers in secondary vocational schools use mobile learning in their teaching more often than teachers in primary schools, and between teachers in primary schools and of teachers in gymnasiums - teachers in gymnasiums use mobile learning in their teaching more often than teachers in primary schools.

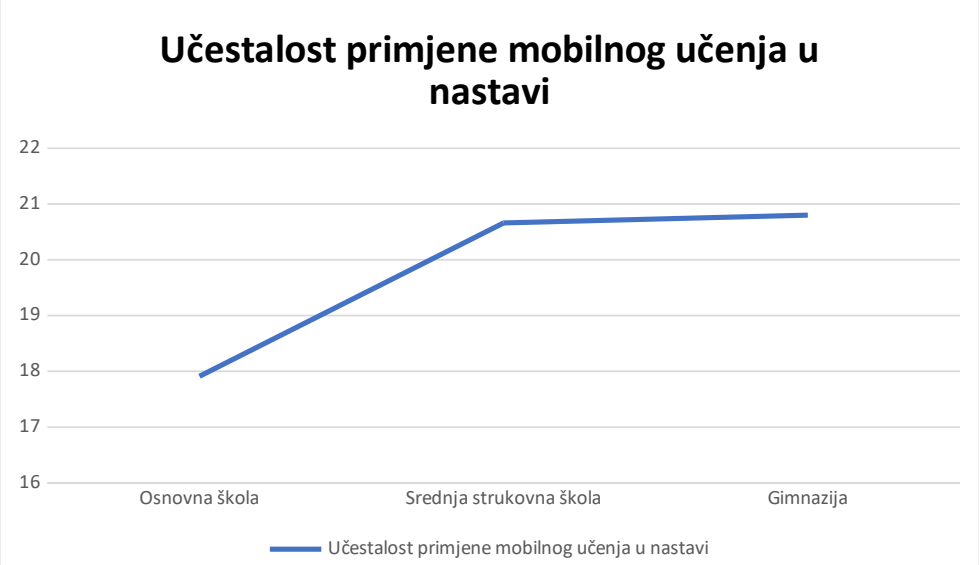

Figure 1: Graphic representation of self-assessment of the frequency of application of mobile learning in teaching by English language teachers in primary schools, secondary vocational schools and gymnasiums (N=121)

There is no statistically significant difference between teachers in secondary vocational schools and gymnasiums on this variable - they use mobile learning equally when teaching. The first hypothesis was confirmed, and the results are shown graphically in Figure 1.

In order to test the second hypothesis, a t-test for independent samples was conducted in which the difference in the frequency of use of mobile learning in English language teaching in rural and urban areas was tested. Table 3 shows the descriptive statistics on the basis of which the t-test was calculated.

Table 3: Descriptive statistics of the frequency of use of mobile learning in teaching in rural and urban areas

	Work area	N	M	SD
Frequency of use of mobile learning in teaching	Rural	81	19.80	4,702
	Urban	40	17.93	6,627

Legend: N – number of participants in each group; M – arithmetic mean; SD – standard deviation

The value of the calculated t-test, with Levene's correction, is 1.6 (df=59,024) and it is not statistically significant at the 5% risk level, which means that the second hypothesis which assumes that there is no statistically significant difference in the frequency of mobile learning use confirmed in rural and urban areas - mobile learning is equally represented as a teaching method in rural and urban areas.

Furthermore, the Pearson correlation coefficient was calculated between the frequency of use of mobile devices in private life and the frequency of use of mobile learning in English language classes. The correlation between the two mentioned variables is 0.49 and is statistically significant at a risk level of 1%. This finding confirms the third hypothesis - there is a positive connection between the frequency of using a mobile device in private life and the frequency of using mobile learning in English language classes - teachers who use a mobile device more often in their private life also use it more often in English language classes and vice versa.

The fourth hypothesis assumes that the majority of English language teachers believe that they have not received enough knowledge about the application of mobile learning in teaching. The analysis showed that as many as 94.2% of the surveyed participants believe that they did not get enough knowledge about the application of mobile learning in classes during their studies, thus confirming the hypothesis. The result is also shown in Figure 2.

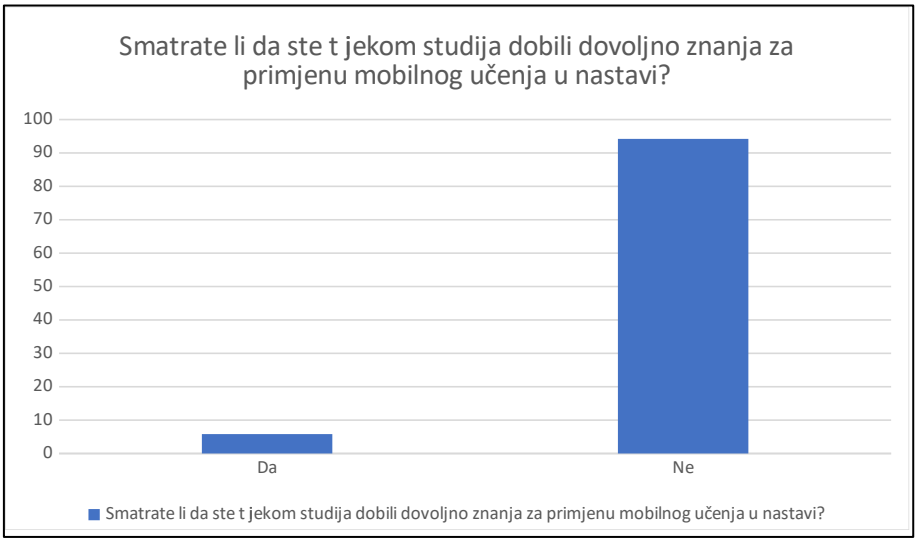

Figure 2: Participants' answers to the question "Did you get enough knowledge during your studies to apply mobile learning in class?", expressed in percentages (N=121)

The fifth hypothesis, which is "Teachers who attended additional training in the field of mobile learning, use this method more often in class and have more positive attitudes towards mobile learning compared to teachers who did not attend such training", was tested using two t-tests for independent samples. In the first t-test, the difference in the frequency of using mobile learning in classes was tested between teachers who attended additional education in this area and those who did not attend such education. Descriptive statistics on the basis of which the analysis was performed are presented in Table 4.

Table 4: Descriptive statistics of the frequency of use of mobile learning in classes by teachers who attended additional education and teachers who did not attend additional education

	Attending additional educations	N	M	SD
Frequency of use of mobile learning in teaching	No	72	18.83	0.610
	Yes	49	19.69	0.838

Legend: N – number of participants in each group; M – arithmetic mean; SD – standard deviation

The value of the calculated t-test is -0.850 (df=119, p>0.05), which determined that the difference between these two groups of participants is not statistically significant, i.e., that teachers who attended additional education in the field of mobile learning and teachers who they did not use mobile learning as a teaching method in English language classes equally often, which is not in accordance with the set hypothesis and expectation. The second part of the hypothesis related to the difference in attitudes towards mobile learning between teachers who attended additional education in this area and teachers who did not. The existence of the mentioned difference was tested with a t-test for independent samples, and the descriptive statistics on the basis of which the test was performed are shown in Table 5.

Table 5: Descriptive statistics of attitudes toward mobile learning among teachers who attended additional education and teachers who did not attend additional education

	Attending additional educations	N	M	SD
Attitudes towards mobile learning	No	72	41,11	0.791
	Yes	49	43,16	0.833

Legend: N – number of participants in each group; M – arithmetic mean; SD – standard deviation

The value of the calculated t-test based on the above data is -1.738 (df=119, p>0.05), from which we conclude that this difference is not statistically significant either, i.e., that teachers have equally positive attitudes towards mobile learning in class regardless of whether they are whether they attended additional education in that area or not. Based on the results of the previous two t-tests, the fifth hypothesis was rejected - teachers who attended additional education in the field of mobile learning and those who did not use mobile learning as a teaching method in the class equally often and have equally positive attitudes towards this method of work.

5. Discussion

As it can be read from the results of the research the first hypothesis was confirmed and there is a statistically significant difference between teachers who teach in primary schools and teachers who teach in secondary vocational schools - teachers in secondary vocational schools and teachers in gymnasiums use mobile learning more often than teachers in primary schools. There are a number of studies that state that the most widespread application of mobile learning is in higher education (Cheon et al., 2012), which is interesting to emphasize in this study, which studies the use only in primary and secondary schools. Our recommendation is to extend the research to higher education institutions as well.

According to the mentioned research, we are free to interpret the results as the habits of high school students and teenagers in general, that they most often use smartphones and communication applications for everyday communication, and that the use of mobile applications is a completely natural tool for them, not only for communication but also for all other activities. High school students are therefore more ready and qualified to accept this way of working than elementary school students, which is why teachers in secondary vocational schools and gymnasiums use and apply mobile applications in foreign language classes much more often than teachers in elementary schools. There is no statistically significant difference between teachers in secondary vocational schools and gymnasiums on this variable - they use mobile learning equally.

It is indicative that the second hypothesis was confirmed and that there is no statistically significant difference in the use of mobile learning in rural and urban areas, i.e., mobile learning is equally represented in rural and urban areas. The results indicate that mobile technology is widespread and available in all areas, which is a positive tendency because it removes the often-present differences in the availability of certain

teaching materials and teaching resources in general in schools in rural areas, which further represents a very serious obstacle in the equal rights of students to education.

The third hypothesis was also confirmed because it was shown that there is a positive relationship between the frequency of using a mobile device in private life and the frequency of using mobile learning in English language classes. Teachers who use a mobile device more often in their private life also use it more often in English language classes and vice versa, which is in line with the assumption that between these two patterns of behavior, a link can be found in terms of a positive attitude towards mobile technology in general, which then from the private sphere extends to the professional as well.

The fourth hypothesis was rejected because it turned out that teachers who attended additional education in the field of mobile learning and those who did not use mobile learning in their classes equally often and had equally positive attitudes towards mobile learning in the teaching process. These results are interesting from the aspect that it can be assumed that there is a high level of independence in the use of mobile learning tools and that teachers can rely on the instructions and tutorials that usually accompany a particular tool. It can also be assumed that formal education in the field of mobile learning has not yet been raised to a level that would make a positive step forward in terms of providing additional useful knowledge, and it can be suggested that it is necessary to work intensively on improving education on this topic, which would provide teachers with additional security in the sense that they have the support of institutions in this increasingly demanding and sought-after field of teaching.

6. Conclusion

Technology is just one of the external learning conditions that, in interaction with internal learning conditions, can be significant for better achievement of educational goals. A scientific understanding has been established that the effect of the media is not unambiguous, isolated, and direct, but multivariate and mediating (Rodek, 2011; according to Topolovčan, 2022). Therefore, all research into the use of different types of media and teaching technology contributes to the creation of a more effective teaching process in which students actively learn in a partnership, participatory and flexible, constructivist-oriented manner.

Since the computer has become an indispensable part of the modern way of life, mobile learning has become one of the key topics in pedagogical discussions and research. Unfortunately, in practice, teachers very often only store materials from Internet pages, even though a modern computer is connected to the Internet and has many other possibilities for improving the teaching process. In order for teachers to use mobile learning more, more thoughtfully, and more didactically justified, they must, first of all, have the knowledge and skills to use tools for mobile learning (UNESCO, 2012).

The research results point to the fact that mobile learning tools are quite egalitarian in the sense that there are no significant differences in several social variables, such as urban and rural schools, as well as the existence of formal education on their application,

therefore, it could be said that teachers have equal opportunities to use mobile technologies and tools for mobile learning.

What is significant about our results is the difference in the use of mobile learning tools in primary and secondary schools, and it should be investigated in more detail how positive this fact is, i.e., at what age it is actually acceptable to expose students to new digital technologies in school, and what are the actual benefits of some more traditional approaches to teaching English as a foreign language.

The use of all forms of digital tools should be critically reviewed and their advantages and disadvantages should be detected, based on the premise that teaching is a value-oriented communication and socialization process in which one should take into account the cognitive, psychomotor, but also the affective aspect of the student's personality, and not view it only as a technocratic act.

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The authors declare no conflict of interest.

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References

Baydas, O., & Yilmaz, R. M. (2018). Pre-service teachers' intention to adopt mobile learning: A motivational model. *British Journal of Educational Technology*, *49*(1), 137-152.

Bartelsen, J. (2011). Mobile learning – an overview. Elmshorn. Nordakademie Hochschule der Wirtschaft.

Biloš, A., Turkalj, D., & Kelić, I. (2017). Mobile Learning Usage and Preferences of Vocational Secondary School Students: The cases of Austria, the Czech Republic, and Germany. Our Economy, 63(1), 6–59. DOI: 10.1515/ngoe-2017-0006

Cheon, J., Lee, S., Crooks, S. M., & Song, J. (2012). An investigation of mobile learning readiness in higher education based on the theory of planned behavior. *Computers & Education*, *59*(3), 1054-1064.

Eaton, S. E. (2011). Formal, Non-formal and Informal Learning in a Nutshell. Teaching English to Adults in Manitoba (TEAM) Newsletter, 4.

Ganesan, P. K., Raja, V. (2019). Mobile Learning. Digital Education APH Publishing Corporation, pp .97-105.

Gedik, N., Hanci-Karademirci, A., Kursun, E., Cagiltay, K. (2012). Key instructional design issues in a cellular phone-based mobile learning project. Computers & Education, 58, 1149–1159.

Harris, P. (2001). "Goin' Mobile" – Learning Circuits ASTD Magazine All about eLearning.

Higgins, S., Xiao, Z. i Katsipataki, M. (2012). The Impact of Digital Technology on Learning: A Summary for the Education Endowment Foundation. Full Report. *Education Endowment Foundation*. 1-52. https://educationendowmentfoundation.org.uk/

Jukić, R., Škojo, T. (2021). The Educational Needs of the Alpha Generation, Mipro 2021

Skala, Karolj (ur.). Rijeka: Croatian Society for Information, Communication, and Electronic Technology – MIPRO, str. 616-621

Korucu, A. T., & Alkan, A. (2011). Differences between m-learning (mobile learning) and e-learning, basic terminology and usage of m-learning in education. *Procedia-Social and Behavioral Sciences*, *15*, 1925-1930.

Kuimova, M., Burleigh, D., Uzunboylu, H., & Bazhenov, R. (2018). Positive effects of mobile learning on foreign language Kukulska-Hulme, A., & Shield, L. (2008). An overview of mobile-assisted language learning: From content delivery to supported collaboration and interaction. ReCALL, 20(3), 271–289. DOI: 10.1017/S09583440080003learning. *TEM Journal*, *7*(4), 837-841.

Kukulska-Hulme, Agnes. (2009). Will mobile learning change language learning?. *ReCALL*, *21*(2), 157-165.

Kukulska-Hulme, Agnes and Traxler, John (2019). Design principles for learning with mobile devices. In: Beetham, Helen and Sharpe, Rhona eds. Rethinking Pedagogy for a Digital Age: Designing for 21st Century Learning. 3rd edition. Routledge, pp. 181–196

Kuimova, M., Burleigh, D., Uzunboylu, H., & Bazhenov, R. (2018). Positive effects of mobile learning on foreign language learning. *TEM journal*, *7*(4), 837-841.

Kukulska-Hulme, A., & Viberg, O. (2018). Mobile collaborative language learning: State of the art. *British Journal of Educational Technology*, *49*(2), 207-218.

Lisana, L. (2023). Factors affecting university students switching intention to mobile learning: A push-pull-mooring theory perspective. *Education and Information Technologies*, *28*(5), 5341-5361.

Matijević, Milan, Radovanović, Diana (2011). *Nastava usmjerena na učenika*. Zagreb: Školske novine.

Miljević-Riđički, Renata, Miljković, Dubravka, Pavličević-Franić, Dunja, Rijavec, Majda, Vizek Vidović, Vlasta, Vlahović-Štetić, Vesna, Zarevski, Predrag. (2000). *Učitelji za učitelje: primjeri provedbe načela Aktivne/efikasne škole*. Zagreb: IEP.

Motiwalla, Luvai F. (2007). "Mobile learning: A framework and evaluation". *Computers & education*, *49*(3), 581-596.

Oller, R. (2012). The Future of Mobile Learning (research bulletin). Louisville, CO: EDUCAUSE Center for Analysis and Research.

Prensky, Marc (2001). Digital Natives, Digital Immigrants. *On the Horizon*, 9 (5), 1–6.

Sharples, Mike, Arnedillo-Sánchez, Inmaculada, Milrad, Marcelo & Vavoula, Giasemi. (2009). Mobile learning. *U Technology-enhanced learning*. 233-249. Springer, Dordrecht.

Stavert, B. (2014). *Bring your own device (BYOD) in schools: 2013 literature review*. Sydney, NSW: New South Wales Department of Education and Communities.

Svalina, V., & Truck-Biljan, N. (2020). Mobile learning in the English language teaching classroom: How to improve teaching English as a foreign language in a vocational school. *ALAR: Action Learning and Action Research Journal*, *26*(1), 15-42.

Svalina, V., & Ivić, V. (2020). New School Culture in The Attitudes Towards Information and Communication Technology of The Students of Vocational Schools in Osijek-Baranja County. *Život i škola: časopis za teoriju i praksu odgoja i obrazovanja*, *66*(2), 83-92.

Svalina, V. Stavovi učitelja i nastavnika prema e-učenju. *Urednice: Marija Sablić Senka Žižanović*, 206.

Sullivan, T., Slater, B., Phan, J., Tan, A., & Davis, J. (2019). M-learning: Exploring mobile technologies for secondary and primary school science inquiry. *Teaching Science*, *65*(1), 13-16.

Tlili, A., Huang, R., Shehata, B., Liu, D., Zhao, J., Metwally, A. H. S., ... & Burgos, D. (2022). Is Metaverse in education a blessing or a curse: a combined content and bibliometric analysis. *Smart Learning Environments*, *9*(1), 1-31.

Topolovčan, T., Rajić, V., Matijević, M. (2017). *Konstruktivistička nastava: teorija i empirijska istraživanja*, Zagreb: Učiteljski fakultet.

Topolovčan, T. (2022). Medijska didaktika: jučer, danas, sutra. Anatomija discipline, povijest i recentni trendovi. *Metodički ogledi, 29* (2), 153-178. Preuzeto s https://hrcak.srce.hr/296366

Traxler, J. (2009). Learning in a Mobile Age. International Journal of Mobile and Blended Learning, 1, 1-12. https://doi.org/10.4018/jmbl.2009010101

UNESCO (2012). Working paper series on mobile learning: turning on mobile learning in Latin America. Paris: UNESCO.