



The Use of Duolingo in Teaching/Learning the Spanish Language: the Croatian Perspective

Krunoslav Mikulan¹, Vladimir Legac², Predrag Oreški³

^{1, 2, 3}University of Zagreb Faculty of Teacher Education, Croatia

Abstract

Croatia, a country heavily reliant on tourism, has seen a significant influx of tourists from Spain and other Spanish-speaking countries. However, Spanish is not as commonly studied as English or German. Introducing Spanish as a foreign language, particularly through an engaging and practical mobile-assisted language learning application like Duolingo, could have a transformative impact on language learning.

Previous research by the same authors demonstrated that respondents held an overall positive opinion about the quality and potential of using the Duolingo app for learning French and Italian [1],[2]. In this study, the authors explored the effectiveness of Duolingo for learning Spanish among university students.

Participants, all of whom were students at the Faculty of Teacher Education in Zagreb studying to become primary or nursery-school teachers, used Duolingo to begin learning Spanish. The app's instructions were in English—a language the students had been studying for an extended period. Students were required to complete at least three half-hour sessions and accumulate 300 points. After completing the mini-course, they took a 10-minute self-constructed Spanish test and completed a short, self-designed questionnaire.

According to the results, students from the sample are interested in foreign language learning and in ICT and they had a moderate achievement in learning Spanish as a new FL after learning it for a very brief duration only by means of Duolingo, which means that Duolingo can be regarded as a useful application for foreign language learning.

Keywords: Duolingo app, teaching Spanish, language anxiety, motivation, information and communication technologies

1. Introduction

Since the EU is a multi-lingual organisation, the need for language competence in two or more languages has been in the forefront of the attempts to introduce foreign language learning in all tiers of education. The 1995 White Paper on Education and Training stated that all European citizens should master two foreign languages in addition to their mother tongue [1]. Therefore, multilingualism is one of key goals of the EU's language policy, which gained considerable importance due to the processes of globalisation and internationalisation [2]. The fast advances in technology have enabled learners to use hand-held devices and language learning applications, such as Duolingo, which is one of the most widely used foreign language learning platforms, with over 500 million users [3]. It is considered to be part of the mobile-assisted language learning (MALL) system, which is defined by McCarty, Obari and Sato as "the formal or informal acquisition ... of a second or foreign language, utilizing handheld, portable, or wearable devices for the purpose of language learning" [4]. Duolingo embodies two key aspects of MALL: gamification, or game-inspired design, and microlearning. According to Rico et al. [5] gamification in particular increases motivation and therefore contributes to more positive learning outcomes, and Lewis [6] states gamification leads to an increased engagement as its main purpose is to make routine tasks more interesting. This is accomplished through the in-app system of points, levels, badges, etc. However, numerous researchers rightly pose the question if the gamification leads to better learning outcomes and how successful it is in reality [7]. According to Stockwell [8], the studies into the use of mobile devices outside of the classroom have shown that learners express positive attitudes towards using mobile devices, but "this has not been translated directly into high levels of engagement to the tools that are provided to them", due to the primary purpose of such devices, i.e. communication and fun, which lead users to perceive their mobile devices as not "appropriate vehicles for learning" [9]. On the other hand, the study by Loween et al. [10] investigates the semester-long learning experiences and results of nine participants learning



Turkish on Duolingo. The participants showed improvement on L2 measures at the end of the study, and results indicate a positive, moderate correlation between the amount of time spent on Duolingo and learning gains. In terms of perceptions of their experiences, the participants generally viewed Duolingo's flexibility and gamification aspects positively; however, variability in motivation to study and frustration with instructional materials were also expressed. Also, studies generally report a lower success rate of learners in productive skills, particularly speaking [11]. The research results appear to be quite varied, and in a systematic review of research dedicated to Duolingo, Shortt et al. [7] conclude that "8 years after the start of research on Duolingo, we still have very little conclusive evidence about its effectiveness and role in the language learning process."

This study follows several previously published papers by the same authors: in the study published in 2019, the participants compared two mobile FL learning applications (Duolingo and Memrise). Results showed mostly positive responses: high interest in FL learning (83.6%), appreciation of gamification (80.1%), quick learning of app usage (85.4%), and liking the flexibility of using the apps whenever and wherever (77.6%). However, only 24% of respondents completely agreed they could learn an FL using one or more mobile applications [12]. A later study, which focused on learning French using Duolingo for Schools, showed a high interest of learners and a level of success in learning correct pronunciation, memorising new words, and practising grammar [13]. Another study [14] compared prospective primary school teachers of English as a foreign language (EFL) with those studying to become primary school teachers of core subjects and nursery school teachers, finding that while both groups saw the potential of Duolingo, prospective EFL teachers had less confidence in its efficiency, and higher interest led to higher test achievement.

1.1. The Role of Foreign Languages in Croatia

Given that a significant portion of Croatia's economy is derived from tourism, foreign languages have always been a key component of the country's educational system. In the past, German and Italian were universally taught in the north and south of Croatia, respectively. However, in recent decades, English has emerged as the most taught foreign language. This shift reflects the language's growing importance in the global context, keeping Croatia in step with international communication trends. The current statistics on the distribution of foreign languages in primary and secondary schools are presented in Table 1 below. Readers should note that primary school in Croatia lasts eight years, and secondary school lasts, depending on the type of school, three to five years. Education in elite grammar schools, in technical schools and commercial schools takes four years, whereas education and training in many vocational schools last three years. The only exception is secondary medical schools, from which nurses and medical technicians graduate in five years. The problem with foreign languages is that students in many parts of Croatia often have limited access to learning languages other than English. In a considerable percentage of schools in many regions, German is also offered. Opportunities for learning Italian are significantly lower than those for German, whereas opportunities for learning French and Spanish in primary or secondary schools are extremely limited. Unequal opportunities for primary schools are evident in Table 2, and those for secondary schools are evident in Table 3. Readers should bear in mind that Croatia is divided into 20 counties, and the capital, Zagreb, constitutes a separate administrative territorial unit. The need for learning Spanish can be illustrated by the official figures provided by the Ministry of Tourism and Sports [15]. According to that news, in 2023, tourists from Spain recorded 234,000 arrivals and 560,000 overnight stays, representing a 21% increase in arrivals and a 19% increase in overnight stays compared to 2022.

Table 1. Recent statistics on primary and secondary school students taking foreign Languages [17]

Foreign language	Percentages of primary school students taking foreign languages in the school year 2019/20	Percentages of secondary school students taking foreign languages in the school year 2019/20
English	95.82	95.92
German	32.55	37.34
Italian	7.86	14.80



French	0.89	4.42
Spanish	0.11	2.22

Table 2. Unequal Opportunities for Learning FLs across Croatia – Primary Schools (tiny percentages in 4 out of 21 counties) [17]

County	Percentage of Students Taking Spanish
Primorje-Gorski Kotar County	0.55
Split-Dalmatia County	0.10
Dubrovnik-Neretva County	1.28
City of Zagreb	0.134

Table 3. Unequal Opportunities for Learning FLs across Croatia – Secondary Schools (small percentages in 13 out of 21 counties) [17]

County	Percentages of Students Taking Spanish
Zagreb County	1.47
Krapina-Zagorje County	0.70
Sisak-Moslavina County	1.16
Karlovac County	1.77
Varaždin County	4.28
Primorje-Gorski Kotar County	1.57
Zadar County	1.99
Osijek-Baranja County	0.49
Split-Dalmatia County	1.68
Istria County	0.90
Dubrovnik-Neretva County	10.01
Međimurje County	2.95
City of Zagreb	4.16

1.2 Possible Solution for the Rise in the Number of Students Learning FLs Other Than English Might Be in the Use of Duolingo

The rise of mobile learning applications, such as Duolingo, Memrise, and Babbel, has democratised language learning. These tools have made it possible for virtually everybody to learn numerous foreign languages, empowering individuals to engage in language learning at their own pace and convenience. Previous research by us (Mikulan, Legac, Oreški) has shown that Croatian university students perceive more advantages than disadvantages in learning foreign languages with the aid of Memrise and Duolingo, when compared with other traditional methods [12]. Although they seemed to have liked both applications, it was clear that they favoured Duolingo over Memrise [12]. Croatian university students studying to become primary school teachers had a moderate achievement in learning French as a new FL after learning it for a very brief duration, only by means of Duolingo [13], [16]. The results from earlier research studies led the authors to investigate whether the Duolingo App could be a solution to the rise in the number of students learning foreign languages other than English in wider parts of Croatia.

2. Methodology

Here, we describe the sample, the experimental procedure, and the instruments used.

2.1 Sample

The sample consisted of a varying number of participants. The experiment began with a course



consisting of 81 participants from Duolingo courses. Eighty-one students participated in the test, and 78 students completed the questionnaire, which constituted the survey. However, since a couple of students had not participated in all three components of the course — the test, the survey, and the final test — the actual number of participants was 68. They were all from the Faculty of Teacher Education of the University of Zagreb (Croatia), studying to become either:

- nursery school teachers (32 students; 47.1%)
- primary school teachers of core subjects in primary school grades 1-4 (24 students; 35.3%) or
- primary school teachers of core subjects in primary school grades 1-4 and primary school teachers of English as a foreign language (12 students; 17.6%).

They were students from year 1 to year 5. There were only two male students who attended the course, wrote the test, and completed the questionnaire (2.9%), while 66 female students (97.1%) participated. At the time of data collection, all participants were between 19 and 25 years of age. For this study, the students in the sample were divided into two groups:

- The first included students studying to become nursery school teachers (32 students)
- The second group consisted of students studying to become primary school teachers of core subjects (24 students) and primary school students of core subjects and foreign languages (12 students), totalling 36 students in this group.

The reason for this was that the former group consisted of students enrolled in a 3-year course for a bachelor's degree. In contrast, the second group consisted of students enrolled in an integrated 5-year programme to graduate with a master's degree.

2.2 Description of the Experiment

The experiment, comprising the course, survey, and testing, was conducted between May and June 2025. The students attending regular courses offered by an ICT and two English teachers in Summer Term 2024/25 were informed about the Duolingo app and the research aims. They were asked to do at least three half-hour lessons of Spanish until they had earned 300 points. A 10-minute self-constructed Spanish test and a self-constructed short questionnaire followed this mini course. Students' participation in the research study was voluntary.

2.3 Instruments

In this research study, two instruments were used: a test and a questionnaire. The authors constructed a Spanish test for beginners and an online questionnaire. They were posted on the Internet. The test contained seven tasks. In Task 1, they had to fill in the blanks in 5 sentences with Spanish (Castilian) phrases used when greeting or introducing oneself, whereby each dot represented one letter, E.g: To the question *¿Cómo estás?* You can answer: ... *bien*, In Task 2, they had to insert the correct personal pronoun in 6 sentences. In task 3, they had to use the proper definite article in 3 sentences. In task 4, they had to use the correct indefinite article in 3 sentences. In Task 5, they had to write how certain combinations of letters are pronounced in four words in four sentences (e.g., the "ch" in the word "much" is read in Spanish as if it were written with the Croatian letter ____). In task 6, the students had to give two Spanish polite expressions. (Each dot represents one letter). In task 7, they had to supply the correct present tense forms, the correct preposition or the correct question word in nine sentences. Sentences were given in Croatian, followed by the Spanish translation with gaps for verbs: *Dolazim iz Seville. Yo vengo .. Sevilla.* (Each dot represents one letter). The theoretical range was 0-34 points. The questionnaire contained 23 items, and 12 of them were analysed for this research study. Most of them were five 5-point Likert scale items. On three items, students were asked to write their own comments, and three were multiple-choice. There were three additional multiple-choice items about students' biodata.

2.4 Aims and Hypotheses

The aims of this current research study were to explore students' interests in FL learning:

- To explore students' interest in ICT
- To learn about their achievement in FL learning in the form of school grades
- To see the students' achievement in learning a new FL by means of the Duolingo for Schools application.

The authors had the following starting hypothesis:



- H1 - Croatian university students studying to become nursery or primary school teachers are interested in FL learning
- H2 – Croatian university students studying to become nursery or primary school teachers are interested in ICT, but less interested than in FL learning
- H3 – Croatian university students studying to become nursery or primary school teachers show high achievement in FL learning in the form of school grades
- H4 – Croatian university students studying to become primary school teachers will have a moderate achievement in learning Spanish as a new FL after learning it for a very brief duration, only by means of Duolingo.

The authors grounded their first and third hypotheses on the popularity of FL learning and relatively high general achievement in FL learning compared to the popularity of FLs and familiarity with FLs in other countries, as well as on the results of their earlier research studies. The second and the fourth hypotheses were grounded on the popularity of ICT technology and smartphones among the Croatian youth as well as on the results of their earlier research studies [12], [13], [14], [16], [18].

3. Results

This chapter is subdivided into two parts. The first focuses on students' interests in FL learning, ICT and their School Grades in FL learning and the second on students' achievement in learning a new language by means of Duolingo.

3.1 Students' Interests in FL Learning and ICT Technology and Their Achievement in FL Learning in the Form of School Grades

As shown in Table 4 below, the students in our sample are interested in FL learning. The mean value is moderately high, 3.61, with a st. dev. of .89. The highest number of students (25 or 36.8%) chose the value 3 (I neither agree nor disagree). This indicates that over one-third of the students are undecided. It was followed by value 4 (I agree), with 24 students (35.91%). This shows that almost the same percentage of students are motivated to learn foreign languages. Nearly 20% (19.3%, or 13 students) are very motivated to learn them because they value them at 5 (strongly agree). Values 4 and 5 together indicate that more than half of the students in the sample have a positive bias towards foreign language learning. (37 students or 54.6%) in our sample. Only six students (8.6%) indicated low interest by circling the value 2 (I disagree) (8.6%). It is also important to note that there was no single student in the sample who was not interested in FL at all, as nobody chose the value 1 (strongly disagree). These results confirm the initial hypothesis (H1): Croatian university students studying to become nursery or primary school teachers are interested in FL learning. However, it should also be mentioned that when compared with the results from a previous research study by the same authors [3], interest in FL learning has decreased, as the mean value then was 4.1 with a st. dev. 0.84. The reason for this decrease, the authors see in the fact that in the earlier study, although they were studying at the same institution, there were more students studying to become primary school teachers of English in grades 1 to 4 in addition to becoming teachers of core subjects (36.51% in 2018 and only 17.6% in this study).

Table 4: Students' Interest in FL Learning

Value	Number of students	Percentage of students
1	0	0.0
2	6	8.6
3	25	36.8
4	24	35.3
5	13	19.3
Mean	3.65	
St. dev.	0.89	

Table 5: Students' Interest in ICT

Value	Number of students	Percentage of students
1	1	1.5
2	6	8.6
3	29	42.6
4	23	33.8
5	9	13.2
Mean	3.49	
St. dev.	0.89	



The results of the second variable, illustrated in Table 5, show that students' interest in ICT is satisfactory, but lower than their interest in FL learning. The mean value was 3.49, with a standard deviation of 0.81. The highest number of students opted for value 3 (29 students, or 42.6%), indicating that a higher percentage was undecided in this variable than in the previous one. This was followed by value 4, with 23 students (33.8%), indicating that almost exactly one-third of the students in the sample agree with the statement. Nine students, or 13.2%, showed the strongest interest, whereas low interest was present among six students, or 8.6%. Unlike in the first variable, in this variable, there was one student who was completely uninterested in ICT. Combinations of percentages for values 4 and 5 show that there were more students positively biased than those negatively biased (values 1 and 2) towards ICT (47% versus 10.1): The results of this variable indicate the correctness of the authors' second hypothesis (H2): Croatian university students studying to become nursery or primary school teachers are interested in ICT, but less interested than in FL learning. Students' high interest in FL learning may have also contributed to a very high level of achievement in their first FL, as evidenced by their grades (see Table 6). It can be seen from the very high mean value (4; st. dev. = 0.85) that the third hypothesis (H3: Croatian university students studying to become nursery or primary school teachers show high achievement in FL learning, as indicated by school grades) was also confirmed. Only two students in the sample, or 2.9% of the students, received a grade 2 "sufficient" rating. Nobody had a grade of 1, "insufficient". The highest number of students, and more than one-third of the sample (36 or 38.2%), had a grade of 4 or "very good", followed by grade 5 or "excellent" (22 or 32.4%). More than one-quarter of the surveyed students (26.5%) had a grade 3 "average".

Table 6: Students' Average Grade in their First FL

Value	Number of students	Percentage of students
1	0	0.0
2	2	2.9
3	18	26.5
4	26	38.2
5	22	32.4
Mean	4.00	
St. dev.	0.85	

Table 7: Number of Active Days

Value	Number of students	Percentage of students
1	5	7.4
2-4	23	33.9
5-7	15	23.1
8-10	10	15.4
12-19	9	13.8
Mean	5.95	
St. dev.	4.69	

3.2 Students' Achievement in Learning Spanish as a New FL by Means of the Duolingo App

The first variable we examined was the number of active days using Duolingo. As shown in Table 7, less than one-tenth of the surveyed students (only 5, or 7.4%) wanted to complete the task in one day. The mean value indicates that the surveyed students spent 5.95 days (st. dev. 4.69) using Duolingo to learn Spanish. Close to three-tenths of the students used it for longer than a week. The highest number was 10. All these figures point to the attractiveness of the Duolingo application. The attractiveness of the Duolingo app is also evident from the results of the second variable, namely the number of mastered units (see Table 8). Students in the sample used the app for more than the minimum required. The lowest number of mastered units was 1, and the highest was 24. The mean value indicates a very satisfying value of 4.11, whereby st. dev. was 4.14.

Table 8: Number of mastered units

Value	Number of students	Percentage of students
1-2	33	49.2
3-5	18	26.4
6-8	10	14.7
10-14	3	4.4
18-24	2	3.0

Table 9: Number of Duolingo XP points

Value	Number of students	Percentage of students
<300	6	8.82
308-398	8	5.88
403-696	4	19.12
706-1486	13	35.29
1544-7729	24	30.88



Mean	4.11
St. dev.	4.14

Mean	1534.15
St. dev.	1625.11

The best information about students' progress offered by Duolingo is the number of Duolingo XP points. As shown in Table 9, only six students (8.82%, less than one-tenth of the sample) failed to meet the prescribed requirement of 300 XP points. Everybody else in the sample earned more points. The mean value was 1534.15, with a standard deviation of 1625.11. This was another indicator of the app's attractiveness for FL learning.

The best indicator of achievement was the last variable: the achievement in the Spanish test for beginners. It can be seen from Table 10 below that the mean value was 17.28, whereby st. dev. was 7.22. A little less than one-third of the students in the sample would not have passed the exam, as they got less than half of the answers wrong. Six students (8.9%) in the sample achieved very low results as they obtained only 3-7 correct answers out of 34. Another six students with values of 15 or 16 were at the borderline. About one quarter would have received a Croatian grade 2 "sufficient" (16 students, 23.53%) as they answered 51 to 60% of the questions correctly. The same number and the same percentage would have received a Croatian grade 3 "average" as they got between 61 and 80% of the correct points. Three students or 4.42% would have been given grade 4 "very good. The same number and percentage would have received Croatian grade 5 "excellent", because they answered more than 90% correctly. We can conclude that students in this sample achieved moderate results on this self-constructed test for beginners and thus confirmed the fourth starting hypothesis (H4: Croatian university students studying to become primary school teachers will have a moderate achievement in learning Spanish as a new FL after learning it for a very brief duration, only by means of Duolingo).

Table 10: Number of Points on the Spanish Test

Value	Number of Students	Percentage of Students
3-7 very low	6	8.90
9-14 poor	16	23.53
15-16 borderline	6	8.90
17-20 sufficient	16	23.53
21-27 average	16	23.53
28-30 very good	3	4.42
31-34 excellent	3	4.42
Mean value	17.28	
St. deviation	7.22	

4. Conclusion

The results of this research study confirmed all four starting hypotheses:

H1 – Croatian university students studying to become primary school teachers are interested in FL learning

H2 – Croatian university students studying to become primary school teachers are interested in ICT technology

H3 – Croatian university students studying to become primary school teachers show high achievement in FL learning in the form of school grades

H4 – Croatian university students studying to become primary school teachers had a moderate achievement in learning Spanish as a new FL after learning it for a very brief duration, only by means of Duolingo.

This means that Duolingo can be regarded as a useful application for foreign language learning. The researchers of this current study believe that it would be necessary to conduct a follow-up research study, which would encompass this and other mobile learning applications to learn other foreign languages, followed by a similar test to verify the achievement in learning the respective foreign languages.



REFERENCES

- [1] Filipan-Žigniċ, B., Sobo, K., Legac, V., "Multilingualism in the European Union", In J. Bushati (ed.), *1st International Conference on Research and Education: Challenges Toward the Future* (ICRAE 2013), Shkodër, Faculty of Education Science, 2013, pp. 1–11
- [2] Vuċić, I., "Međujeziċni utjecaj engleskoga jezika na ovladavanje talijanskim i francuskim jezikom u osnovnoj školi [Crosslinguistic influence of English on learning Italian and French in Croatian elementary schools]", *Strani jezici*, 49(1), 2020, pp. 3–29
- [3] Pires, L., "Duolingo Users and Growth Statistics", <https://usesignhouse.com/blog/duolingo-stats/>, 2024
- [4] McCarty, S., Obari, H., Sato, T., "Implementing Mobile Language Learning Technologies in Japan", Singapore, Springer, 2017
- [5] Rico, M., Naranjo, M. J., Delicado, G., Plaza, N., & Dominguez, E., "Let's Move: Mobile Learning for Motivation in Language Acquisition", In: Pixel (ed.), *ICT for Language Learning*, 7th Conference Edition, (pp. 86-90), Padova, Webster srl, 2014
- [6] Lewis, G., "Learning Technology", London, Oxford University Press, 2017
- [7] Shortt, M., Tilak, S., Kuznetcova, I., Martens, B., & Akinkuolie, B., "Gamification in mobile-assisted language learning: a systematic review of Duolingo literature from public release of 2012 to early 2020", *Computer Assisted Language Learning*, 36(3), 2023, pp. 517–554, <https://doi.org/10.1080/09588221.2021.1933540>
- [8] Stockwell, G., Hubbard, P., "Some Emerging Principles for Mobile-Assisted Language Learning". Monterey, CA, The International Research Foundation for English Language Education, 2013, http://www.tirfonline.org/wp-content/uploads/2013/11/TIRF_MALL_Papers_StockwellHubbard.pdf
- [9] Stockwell, G., "Mobile Language Learning", In: Farr, F. and Murray, L. (eds.), *The Routledge Handbook of Language Learning and Technology*, Routledge, New York/London, 2016
- [10] Loewen, S., Crowther, D., Isbell, D., Kim, K., Maloney, J., Miller, Z., Rawal, H., "Mobile-assisted language learning: A Duolingo case study", *ReCALL*, 31, 2019, pp. 293-311, https://www.researchgate.net/publication/333431833_Mobile-assisted_language_learning_A_Duolingo_case_study
- [11] Xiangying J., Rollinson, J., Chen, H., Reuveni, B., Gustafson, E., Plonsky, L., and Pajak, B., "How well does Duolingo teach speaking skills? Duolingo Research Report DRR-21-02", 2021, <https://duolingo-papers.s3.amazonaws.com/reports/duolingo-speaking-whitepaper.pdf>
- [12] Oreški, P., Legac, V., Mikulan, K., "Motivational Potential of Mobile Foreign Language Learning Applications Duolingo and Memrise and Their Use Among University Students in Croatia", *Psique*, Lisboa, 15 (2019), 1; 2019, pp. 9-29, doi: 10.26619/2183-4806.XIV.1
- [13] Mikulan, K., Legac, V., Oreški, P., "The Use of Online/Mobile Applications in Foreign Language Learning/Teaching: An Experiment into Learning French with Duolingo School", *Pedagoška revija*, Skopje, 10 (2019), 1; 2019, pp. 57-64
- [14] Oreški, P., Legac, V., Mikulan, K., "Relationship between Students' Interest in Foreign Language Learning and Their Achievement in Learning a Foreign Language with a Mobile Learning Application", *Technological Innovation Put to the Service of Language Learning, Translation and Interpreting: Insights from Academic and Professional Contexts*, Berlin, Bern, Bruxelles, New York (NY), Oxford, Warsaw, Vienna, Peter Lang, 2023, pp. 181-196, doi: 10.3726/b20168
- [15] Republic of Croatia, Ministry of Tourism and Sport, "Brnjac: S tržišta Španjolske i Južne Amerike Hrvatska bilježi sve bolje turističke rezultate [Brnjac: Croatia is recording increasingly better tourism results from the Spanish and South American markets]", Retrieved on August 15th, 2025 from <https://mint.gov.hr/vijesti/brnjac-s-trzista-spanjolske-i-juzne-amerike-hrvatska-biljezi-sve-bolje-turisticke-rezultate/23708>
- [16] Legac, V., Mikulan, K., Oreški, P., "Potentials of Learning a New Foreign Language Using Duolingo App: Opinions of Croatian University Students", *Perspectives on Teacher Education and Development*, Maribor, University of Maribor University Press, 2023, pp. 391-413, doi: 10.18690/um.pef.1.2023.21
- [17] Kapović, M., "Strani jezici u formalnom obrazovanju u Hrvatskoj [Foreign languages in formal education in Croatia]", *Strani jezici* 51 (2022), 2022, pp. 283-309
- [18] Oreški, P., Mikulan, K., Legac, V., "Benefits and Deficiencies of Mobile Foreign Language Learning Applications", *IICE 2018 Proceedings*, Dublin, Infonomics Society, 2018, pp. 30-35, doi: 10.2053/IICE.2018.0145