THE DEVELOPMENT OF LINGUISTIC COMPETENCE IN THE DIGITAL ERA

HANA VANČOVÁ (ED).

University of Hradec Králové
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TABLE OF CONTENTS

INTRODUCTION

Digital technologies have become an essential part of people's lives. Technology allows the growth of society in many spheres at a pace nobody could expect centuries or even decades ago. As a result, many call this period of development a digital age. Technologies have also impacted the sphere of education, and only recently they became the sole mediator between learners and teachers. Technologies shared, collected, and evaluated learners' work or allowed them to collaborate across different areas of study. Undoubtedly, the correctly selected digital tools provide an excellent service to learners and teachers.

The aim of this publication titled Development of linguistic competence in the digital era is to outline the current state of using digital tools in language learning, presented on the background of four studies mapping the practical experience of pre-service teachers of English who investigated the potential of different types of digital tools and applications for developing linguistic competence. The book consists of four studies written by students of the Department of English language and Literature, the Faculty of Education, at the University of Trnava. They demonstrate the longitudinal interest of the department in various issues related to digital literature and digitally supported literature education, which led to proposing the complex project KEGA 019TTU-4/2021 *Introducing new digital tools into teaching and research within transdisciplinary philology study programmes*, which is funded by the Ministry of Education, Science, Research, and Sport of the Slovak Republic. It intends to study necessary innovations in the content and possible modernization of methodological tools used in philological study programmes (Godiš, 2021, 2022a, 2022b; Hitková, 2021; Hitková & Hitka, 2022; Horváthová, 2022; Hriňák, 2021, 2022; Kocianová, 2021; Komlósi, 2021; Liashuk, 2021a, 2021b; Pokrivčák, 2022a, 2022b; Pokrivčáková, 2021, 2022a, 2022b; Vančová, 2021a, 2021b).

In the first chapter, Klára Frištyková presents her study into the role of Grammarly, a grammar correction application, to develop the grammatical competence of English learners. She used a questionnaire to investigate the participants' familiarity with grammar correction applications.

Nina Kramecová collected learners' opinions who used the platform LMS Moodle during distance education. This platform is frequently used; therefore, it is necessary to identify its strengths and weaknesses.

In the third study, the way learners learn vocabulary using digital tools was investigated by Dominika Matulová. Moreover, the author also provides a comprehensive list of vocabulary-developing websites, digital tools and applications available to learners of English at the time of publishing her study.

In the final study, gamification and its principles, attitudes of learners to games and its use in language learning are investigated by Tomáš Meliš. The author collected the opinions of participants from four countries.

As a whole, the publication of the studies will contribute to teaching practices in language learning in Slovakia, using the latest forms of learning. The valuable experiences the authors present will hopefully inspire other teachers who will follow in their footsteps.

Editor

Automatized tools for checking grammar in teaching English as a foreign language

Klára Frištyková

Introduction

Because English is many people's second language, they might make mistakes. Consequently, they need corrections and those who want to learn proper grammar need helpful feedback (Horváthová et al., 2017). One of the solutions could be grammar checker software. This tool is becoming increasingly popular among learners of English as a second language in their English writing worldwide because it provides a quick and instant check of any writing. Attali (2004) noted that some software could check five main areas of writing: grammar, style, organization, usage, and mechanics, which are crucial for adequate feedback. It included errors such as subject-verb agreement, incorrect word usage, wrong punctuation or incorrect verb formation. Although an increase in using the software can be noticed, teachers should consider their application to the learning process. In some cases, it is considered that it can help teachers speed up the process of grading essays and help students with English learning writing autonomy. On the other hand, teachers should give proper instructions and notify students about the software's possible limitations.

The history of automated grammatical error detection

The history of automated grammatical error detection is more profound than one might think. As Chen and Cheng (2008) point out, these tools for automatic writing detection started their journey in the 1960s, and they were initially designed to help teachers with error correction in students' essays. However, artificial intelligence technology significantly changed the sphere of automated writing detection in the mid-1990s. According to Chen and Cheng (2008, p.94), software such as Criterion or My Access! "boast the ability to conduct more sophisticated analyses including lexical complexity, syntactic variety, discourse structures, grammatical usage, word choice, and content development". Soni and Thakur (2018) describe that the most significant trend of software shaping has been here since the 1980s. Firstly, the aim was to identify punctuation and stylistic errors. However, as time passed and many developers presented different tools, the devices started to provide analysis of more and more different errors. The software was slowly formed into the shape that has become known today.

As with every world-known technology, Automated Grammatical Error Detection (AGED) software needed continuous gradual development to get into functional shape. Many developers worldwide used different techniques to present their approach to AGED.

We could distinguish three main categories:

1. *Rule-based technique* is designed as grammar rules by linguistic specialists. Based on the rules, this technique checks the text, categorises it with parts of speech and corrects the mistakes. This technique is straightforward because the rules can be smoothly edited based on the language's grammar. On the other hand, an understanding of the language is imperative. Moreover, systems based on this technique can be beneficial for language learners because they can explain marked mistakes (Soni & Thakur, 2018).

2. *Machine Learning-based techniques* are considered the most common among grammar checking tools as they deliver the most profitable outcomes. They use annotated corpus operated for statistical analysis of the given text to notice immediately and correct mistakes made by the writer. On the other hand, they cannot explain the errors as the rule-based techniques can and do not need a comprehensive understanding of the grammar because they depend on the corpus. However, a lack of a large, annotated corpus makes it challenging to apply to grammar-checking systems (Soni & Thakur, 2018).

3. *Hybrid technique*, as Soni and Thakur (2018) suggest, is a mix of rule-based and machine-learning techniques, could be used for the improvement of grammar-checking tools because some mistakes are more suited for rule-based techniques, and some for machine learning techniques. For example, the use of articles is solved adequately by rule-based techniques and determiner use by machine learning. As a result, a broad spectrum of various mistakes could be identified by these hybrid techniques.

Pedagogical use of automated grammatical error detection

Being a good English teacher takes much work. We live in a world where technologies significantly impact our everyday lives, influencing teachers and learners. Including these technologies in the learning process could be challenging if the teachers need to become more familiar with them. On the other hand, if they are used adequately and in a suitable learning environment, they could bring significant outcomes to the learning process. As Pokrivčáková (2012) and Pokrivčáková & Pokrivčák (2016) suggested, a good and modern teacher is a creative, practical professional who can choose the best methods for themself. Automated writing detection software could be one of these technology tools if used at an appropriate time. As Leacock et al. (2014) pointed out, many students' writings are evaluated worldwide in one day. English is considered the most studied second language worldwide. In addition, language learners can make mistakes because of many factors, such as the influence of their native language, misunderstanding of English grammar or inattention. As we mentioned, grammar

checker software was initially designed to help teachers with the grading process of massive amounts of writing made by students. (Chen & Cheng, 2008). However, the question is whether these systems have other benefits in English language learning and teaching for foreign language learners.

Formative role rather than summative

Chen and Cheng (2008) addressed whether the previous research on using grammar checker programs was reliable and if they showed actual outcomes of using software in schools. They found that the programs are suitable for the revising process of individuals during their writing and play more of a formative role better than a summative one. Immediate feedback can motivate students to write because they do not need to wait for results. However, software mainly focuses on elements of the formal side, which can not sometimes be favourable because content and organization are also important.

As Cheville (2004) pointed out, writers tend to go for higher scores, which the system can give them, even though the writing's context does not make sense. Learning a language is a very complex issue. It includes skills in grammar, the vocabulary of an individual, correct spelling, pronunciation and speaking, and English use in every sphere.

In their research, Chen and Cheng (2008) focused on comparing evaluations done by grammar checker programs with human intervention in the three different classes, where each teacher used a different approach to using grammar checker software. Designers of grammar checkers emphasize that programs can evaluate essays as humans do, but linguistics is sceptical because writing is a more complex matter. The researchers discovered that the class where the use of grammar checker software was joined with adequate human feedback and reasonable instructions from the teacher responded positively to the use. On the other hand, in a class where students did not receive reasonable instructions and human feedback, they did not respond positively and felt nervous about the use. Their research showed that human feedback should be present when the students use grammar checker systems because writing is a social-communicative action.

Comparison of teacher feedback and suggestions of automatized writing detection tools

Feedback is essential in the learning process. However, as Pokrivčáková (2012) pointed out, it is also challenging for teachers to give suitable feedback to students. On the other hand, it can encourage learning if it is personal and adequate.

The research made by Ghufron and Rosyida (2018) did a similar study to Chen and Cheng (2008), but they compared two groups of 40 students from Indonesia. They compared teacher corrective feedback and the use of Grammarly in writing evaluations and wanted to find out which is more useful for the progress of students' writing.

Astia (2018) comments that teachers use corrective feedback to indicate when students incorrectly use the target language. Moreover, students should correct their grammatical mistakes after the teacher's comment. Researchers did some pre-test, after which one group of students used Grammarly software and the other one was evaluated by the teacher. After that, students were again tested. Based on the pre-test analysis, groups were on the same initial point. They had similar abilities in EFL writing, which were considered based on the five measures: grammar, spelling and punctuation, content, organisation, and diction. The experimental group independently submitted their writing to Grammarly software to evaluate and correct their writing. The Control group submitted their writing to the teacher and got the teacher's corrective feedback with highlighted errors and feedback, and after that, students should revise their work alone. This whole process was repeated during one semester (Ghufron & Rosyida, 2018).

According to Ghufron and Rosyida's (2018) research, the post-data showed a marked difference between the mean score of these two groups. The group that used Grammarly software scored higher than the group evaluated by teacher feedback. It meant that Grammarly was more useful in reducing students' mistakes. Mainly in diction, grammar and spelling and punctuation. On the other hand, the teacher's corrective feedback brought better results in organisation and content, for which Grammarly is not very useful. The authors described this mainly because Grammarly supports students' independence, motivation and engagement in the teaching and learning process. They could find out their aptitudes and defects in language learning. Researchers claim that teacher corrective feedback is done after a period of time, and students often do not look at it afterwards and could feel embarrassed by their mistakes in front of the teacher. Students who used Grammarly showed notable improvement in EFL writing thanks to Grammarly's features such as identifying vocabulary, language, spelling or punctuation errors.

On the contrary, researchers found that software is not completely useful in terms of content and sentence organisation compared to teacher feedback, which can analyse these types of mistakes more precisely. Moreover, some students' language knowledge could be deficient, and using Grammarly could not be beneficial for them because it could not provide adequate feedback for their writing (Ghufron & Rosyida, 2018).

Suitability of implementing grammar checkers

The suitable implementations of grammar checker software seem like the key factor in the learning process. Therefore, many authors tried to investigate how it should be done. For example, Chen and Cheng (2008) described four main points that students, who use software, find crucial. The first suggestion students recommended was that the tool "be used only as references to show whether their writing can be improved during the drafting and revising process rather than actual indicators of their writing performance" (Chen & Cheng, 2008, p. 106). It is

important to note that some of the students' writings were evaluated only by software in their research. The second suggestion focused on the necessity for human feedback. Most students found teacher feedback more beneficial because it included personal comments. The third suggestion commented that the tool could be helpful for students with lower proficiency levels because the students in the research were third-year English majors, and they did not want to be assessed by some machine. Finally, the last suggestion was that since the purpose of learning writing can differ, not every student needs to learn proper grammar rules.

The views of English instructors

While educators in the research of Chen and Cheng (2008) were more sceptical towards the usage of grammar checker software, other researchers showed more favourable results. It could be influenced by the methods instructors used or the ability level with the grammar checker software usage.

Link et al. (2014) carried out a study that focused on instructors' views on using grammar checkers in lessons. Instructors' work was to implement the grammar checker tool Criterion into their classes and review the use. The study analysed their teaching techniques, feelings toward the usefulness, and contentment or problems with the usage.

The researchers Link et al. (2014) pointed out that grammar checker software has different use methods. For example, educators could use it to reduce the time for checking or students to help with autonomy. However, as many other researchers claim, it is essential to explain how to use it correctly if it is presented to students as a helpful tool for checking grammar. Moreover, instructors should be the first to find it out by themselves. It could be an influential factor in the whole experience with the software. Therefore, it is important to note that the instructors of this study were experienced users of the software. Another key factor was that they used the same syllabus during the usage.

The study showed that instructors generally recommended the usage. However, they highlighted that it is crucial that instructors are willing to search for the best practices in their classes by investigating problems, effects or adaptations during the teaching process (Link et al., 2014).

Reasons of non-use

Foster (2019) researched the use of grammar checker software OpenEssayist. The study showed that most students did not use grammar checker software. He wanted to find out what is the reason and decided to interview two non-users of this grammar checker software. The interviews showed the reasons for technical difficulties and the absence of time to use them. However, after a deeper investigation, the research showed that it is possible that not all students were familiar that could use the software to help.

Cavaleri and Dianati (2016) formulated similar findings. Their research primarily focused on other things, such as the usefulness or limitations of using

Grammarly. However, they also analysed why other students who could use Grammarly during their writing did not use it. It showed that many students did not know about the offer to use the software.

Grammarly

Grammarly, a digital writing helper, is seen as the most valid English grammar checker. It is a tool where you can paste or upload your writing, and it will be checked. Moreover, free version features are grammar, spelling, punctuation, style and sentence structure help (Cavalari & Dianati, 2016).

The company's primary goals are being ethical, adaptable, gritty, empathetic, and remarkable. In recent years, it has become available for Chrome, Safari, Firefox and Edge browsers, desktop applications, keyboards on iPhone or Android devices, and Microsoft Office on Windows and Mac. In 2020, 30 million users reached Grammarly during a day, and the Grammarly Business, suitable for workplace communication, was used by 30 000 work teams worldwide. Grammarly founders' main goal was to create a place where people could feel more confident and effective in their writing and make an intelligent assistance tool. The tool's goal is to be centred on correctness, engagement, clarity, and writing delivery. The founders also realised the struggles that come with first drafts and the problems that can arise for those with dyslexia (Lytvyn, 2021).

History of Grammarly

Grammarly's developers, Shevchenko, Lider and Lytvyn, came up with an idea to help people with everyday communication, such as emails, student essays or proficient writing, by creating English writing assistance to help them communicate naturally in 2009. However, the first tool for plagiarism checks was designed before that with their earlier company MyDropBox. They were trying to discover what leads people not to use their own words but instead use somebody else's ideas (Lytvyn, 2021). The first version of Grammarly was not free and mainly focused on checking grammar. However, the tool was very appealing to people, and the company has started to grow. Consequently, the software changed into a free model and was used by people worldwide.

Research on the use of Grammarly

Cavaleri and Dianati (2016) provided research in which they tried to analyse Australian college students' opinions towards Grammarly. It was based on Davis' Technology Acceptance Model, a model based mainly on the usefulness and ease of use of the technology perceived by users.

Firstly, the research collected students' attitudes towards their writing. 61,1% of students agreed that they do not need any help with writing but a proofreading service. 55,6% of students disagreed that their knowledge of English grammar and vocabulary is weak. 50% agreed that they did not always feel confident writing a

correct sentence, and 38,9% agreed that they were fine with English grammar (Cavaleri & Dianati, 2016).

Then, the respondents chose a degree of agreement with different statements about the usefulness and ease of use. 83,3% of students rated the usefulness of Grammarly very highly, and 94,4% of students rated Grammarly as extremely easy to use. 83,3% agreed that Grammarly gave them detailed feedback and made helpful suggestions to improve their writing. 72,2% agreed that the explanations were good and helped them better to understand the grammar (Cavaleri & Dianati, 2016).

On the other hand, statements about the limitations of Grammarly were also presented to students. Again, they chose a level of agreement with the sentences presented. 22,2% agreed that feedback has not always been helpful. 44,4% agreed with the statement that they did not agree with some suggestions. However, only 11,1% of students could not understand some explanations, and 5,6% had technical issues with Grammarly (Cavaleri & Dianati, 2016).

According to Cavaleri and Dianati's (2016) research, most students evaluated that the software positively impacted their writing and helped them with their confidence to write. Therefore, the researchers concluded that users of Grammarly were satisfied with the tool, and in most cases, it was useful. They suggested that students should probably continue using the tool for checking grammar.

Research

Research objectives

This study's main aim was to determine whether the students of Slovak universities and high schools use automated writing detection software and their opinions on their writing skills, usage and limitations of grammar checker tools.

The secondary aims of the study were:

- To identify if the students' school, proficiency level or the area in which the student uses writing in English influence the usage of the grammar checker software.
- To compare students' attitudes toward their writing skills in English regarding whether they used or did not use grammar checker software.
- To find out the reasons for the non-use of students who do not use grammar checker software.
- To analyse students' opinions towards the usage of the software.

Research questions

We aim to find out the answers to the research questions:

1) What are the attitudes of students who use and don't use grammar checker software for their writing in English?
2) What kinds of software do students usually use?
3) What are the attitudes of students to the usage of software?
4) What are the limitations of grammar checker software?

5) What effect does the use of software have on the students' attitudes toward writing?

Methodology

An anonymous questionnaire was chosen as the research method. It is a set of written or printed questions with a selection of answers created for a survey or study. It has many advantages, such as the fast collection of many respondents, the anonymity of respondents compared to an interview and respondents having as much time as they need to think about answers. In our case, it was chosen because of the fast data collection. It is known that there are different types of questionnaires. The easiest to analyse are those with close answers, where respondents can choose from multiple choices. Another type is the open-ended questionnaire, which could be more challenging for researchers to evaluate. There is also the questionnaire with dichotomous (yes/no) questions. In some questionnaires scaling questions are popular, where respondents can rate their answers to questions on a rating scale.

All types of questions were chosen in this research depending on the given question. We made the questionnaire, but questions from the 7th to the 13th were inspired by an existing one made at Australian College by Cavaleri and Dianati (2016). The survey was conducted from March to April 2022 and was presented in the Slovak language. We collected 74 answers. The requirement was to be a Slovak university or high school student and to have some dealings with writing in the English language. We shared it via social networks and the faculty's Facebook webpage. It consisted of 13 different questions. The first to fourth questions were focused on demographic data. Then, questions from the fifth to thirteenth were focused on students' attitudes towards their writing, usefulness and limitations of the software. Questions number 2 and 8 were open. Questions number 7, 9 and 10 were scaling questions. Questions number 3, 4, and 11 were closed. Questions 1 and 6 were combined, and questions 5, 12 and 13 had yes-no (dichotomous) answers.

Respondents

The first four questions were focused on respondents' demographic data. Our respondents were Slovak university or high school students who have some dealings with writing in English. We have received replies from 74 respondents, mainly students of the University.

Other schools were secondary vocational schools, secondary grammar schools and bilingual secondary grammar schools. Most respondents chose to have a B2 or C1 level of English. More than half of the respondents stated that they have been learning English for 12 to 15 years and have an English writing lesson at school.

Question 1: Where do you study?

Regarding our respondents' current study place, we found out that more than three-quarters of them, 58 (78%), study at a university and 16 (22%) at some Slovak High Schools.

Question 2: How long have you been studying English?

This question was open and was divided into six ranges. The primary range was 14-15 years, representing 22 respondents (30%). Then, 21 respondents (28%) answered that they have been studying English for 12-13 years, 12 respondents (16%) responded that they have been learning English for 10-11 years and ten respondents (14%) answered that they have been studying English for 16-17 years. On the other hand, only seven respondents (9%) answered the range 8-9 years; the smallest part, two (3%), replied 18+ years.

Question 3: What is your level of English?

Question number 3 dealt with the respondents' level of English. All of them chose some English level. C1 level was the most common among all respondents. Thirty-one respondents (42%) chose this answer. B2 level was right after C1, representing 30 respondents (40%). The answer B1 level was selected by 13 respondents (18%).

Question 4: Where do you encounter writing in English?

We wanted to find out where respondents encounter writing in English in this question. Most of them, 43 respondents (57%), have writing lessons in school. The answer "I use English writing on social networks" chose 17 respondents (24%). In addition, ten respondents (14%) use English writing in private, and only four (5%) chose to use English at work.

Data analysis

Question 5: Do you use software for automated writing evaluation?

In question number 5, we asked whether the students use software for automated writing evaluation. We divided their answers based on the school where they study, their level of English and where they encounter English writing.

Regarding the school where they study, ten respondents (62,5%) studying in high school do not use software, and six (37,5%) studying in high school use grammar checker software. 34 University respondents (59%) do not use grammar checker software, and 24 respondents from universities use software (41%).

Looking at the respondents' level of English, ten respondents of level B1 (77%) do not use grammar checker software, and three respondents of level B1 (23%) use grammar checker software. Nineteen respondents of B2 level (63%) do not use grammar checker software, and 11 (37%) use grammar checker software. Fifteen respondents of a C1 level (48%) do not use grammar checker software, and 16 (52%) use grammar checker software.

Considering the area where they encounter English writing, 22 respondents (51%) who have English writing lessons do not use software, and 21 (49%) of those who have English writing lessons use grammar checker software. Students who do not have English writing lessons but encounter English writing in other

areas, such as social networks, school or private, use grammar checker software less. 22 (71%) do not use software, and 9 (29%) do not.

Overall, 30 respondents (40%) use grammar checker software, and 44 respondents (60%) do not use the software.

To sum up, we can say that students' proficiency level influences software usage. With the rising students' proficiency level, the use also increases. Schools where students study do not influence the usage because both groups, High School students and University students, have similar results. On the other hand, the area students write in English impacts software usage. Students who have English writing lessons use grammar checker software more than those who do not have lessons.

Question 6: Why do you do not use grammar checker software?

In question number 6, we focused on why 44 students who chose the answer "no" in the previous question did not use the software. Eighteen respondents (41%) chose "I don't know any software". The answer "I don't need any software" chose 12 respondents (27%). "Feedback from the teacher is enough" selected five respondents (11,5%). Five respondents (11,5%) chose "This software does not seem helpful to me", and four students chose the answer "other". They stated responses: "I haven't used the grammar checker software yet."; "I don't have the option to use it."; "I know it, but I didn't think to use it."; "I use only Google Translate."

We concluded that half of the students, including those who chose "other" as an option, have not known any software or had not considered using it yet. We could assume that they would consider using it if they knew it.

Question 7: What are your attitudes towards your writing?

In question number 7, we asked all respondents, those who use grammar checker software (YES group) and those who do not use it (NO group), their attitudes towards their writing. The question was inspired by Cavaleri and Dianati's (2016) questionnaire. We created seven statements about their writing, and respondents should choose one option of their level of agreement.

We divided their answers into two graphs and sorted the statements based on the positive, negative or neutral attitudes. The first free, "I'm completely independent when I write in English.", "I'm satisfied with my English grammar level." and "I'm satisfied with my English vocabulary knowledge." were concentrated more positively. Then, the next three, "I don't feel confident when I write in English.", "My knowledge of English vocabulary is weak." and "My knowledge of English grammar is weak." were concentrated more negatively, and the last statement, "I use help when I write in English." had a neutral tone.

When we look at the 1st statement, the results showed that more than half of the YES group (16 respondents, 53%) chose "disagree" or "strongly disagree". On the other hand, the result of the NO group was less straightforward. 19 respondents (43%) chose "disagree", and 20 (45%) respondents chose "agree" or

"strongly agree". Therefore, we could conclude that those who use grammar checker software feel slightly less independent with writing in English.

In the 2nd statement, 16 respondents (53%) of the YES group chose "agree" or "strongly agree", and 12 respondents (40%) chose "disagree" or "strongly disagree". The second group was again a little bit less straightforward. 18 respondents (40%) chose "agree" or "strongly agree", and 17 respondents (39%) chose "disagree". The results showed that the YES group felt slightly more satisfied with the English grammar level.

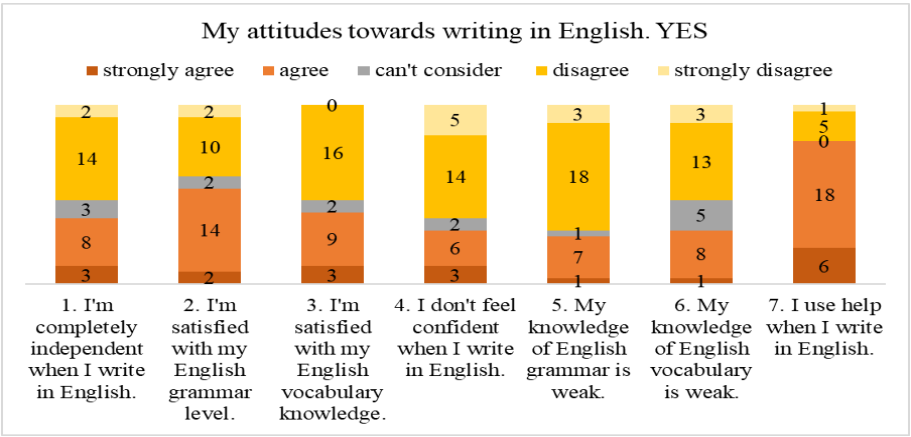
The answers to the 3rd statement showed very similar results for both groups. A little bit more than half of the respondents chose "disagree" or "strongly disagree", 16 respondents (53%) of the YES group and 23 respondents (52%) of the NO group. We could say that most respondents were unsatisfied with their English vocabulary knowledge.

In the 4th statement, the majority, 19 respondents (63%) of the YES group and half of the NO group, 22 respondents, chose "disagree" or "strongly disagree". On the other hand, the answers "agree" or "strongly agree" chose nine respondents (30%) from the YES group and 17 respondents (39%) from the NO group. Consequently, we could claim that most of the YES group and half of the NO group feel confident writing in English.

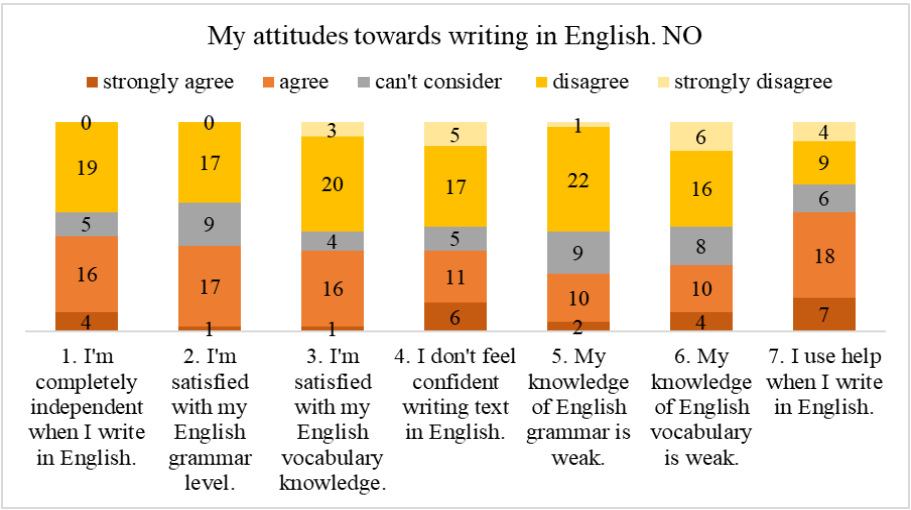
The most significant differences showed the results of the 5th statement. Twenty-one respondents (70%) of the YES group and 23 respondents (52%) of the NO group chose "disagree" or "strongly disagree". On the other hand, 27% of both groups, 8 of the YES and 12 of the NO, chose "agree" or "strongly agree". We could say that students do not consider their knowledge of English grammar weak. Moreover, comparing the groups, the YES group was more straightforward.

The answers to statement number 6 were very similar in both groups. Nine respondents (30%) of the YES group and 14 respondents (32%) of the NO group chose "agree" or "strongly agree". On the contrary, 16 respondents (53%) of the YES group and 22 respondents (50%) of the NO group chose "disagree" or "strongly disagree". Half of the students do not consider their knowledge of English vocabulary as weak.

The last statement was focused on whether the students use help when they write in English. Twenty-four respondents (80%) of the YES group chose "agree" or "strongly agree", and only six respondents (20%) chose "disagree" or "strongly disagree". Twenty-five respondents (57%) of the NO group chose "agree" or "strongly agree", 13 respondents (30%) chose "disagree" or "strongly disagree", and six respondents (13%) chose "can't consider" (see Graph 1). We could say that most students stated that they use some help. Moreover, the YES group was more straightforward because 80% agreed that they use some help.



Graph 1: Respondents´ attitudes towards writing in English – YES group



Graph 2: Respondents´ attitudes towards writing in English – NO group

Data analysis of the respondents who use the software

From the results of question number 5, we found that 30 of 74 respondents use grammar checker software. We analysed that six respondents (20%) of 30 who use grammar checker software were High School students, and 24 (80%) were University students.

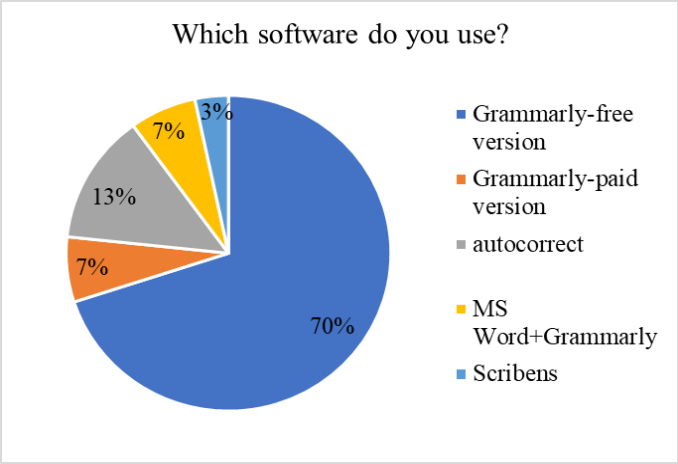
Furthermore, three respondents (10%) chose the B1 level, 11 (37%) chose the B2 level, and 16 students (53%) of those who use grammar checker software chose the C1 level of English.

Twenty-one students (70%) have English writing lessons at school and nine respondents (30%) of those who use grammar checker software use writing in English in other areas. Accordingly, we could conclude that most users were University students, chose the C1 level or had English writing lessons at school. Therefore, we concluded that our users had a higher proficiency level in English. After a more profound examination, we found that 12 respondents (40%) of all users of grammar checker software were University students who chose the C1 level and had English writing lessons at school.

Question 8: Which software do you use?

Question number 8 was an open question where students could write which software they used. After summarising the most common answers, we divided them into seven groups. 21 students (70%) used the free version of Grammarly, two students (7%) used the paid version of Grammarly, four students (13%) used autocorrect, two respondents (7%) used Grammarly and MS Word, and one respondent (3%) used Scribens.

The most used software was the free version of Grammarly (see Graph 3).



Graph 3: The used types of writing software

Question 9: Students' attitudes to the usefulness of software

In question number 9, we asked students to express their attitudes towards the usefulness of the software they use. Again, they should rate their agreement with the statement on a scale from strongly agree to disagree strongly (see Graph 4).

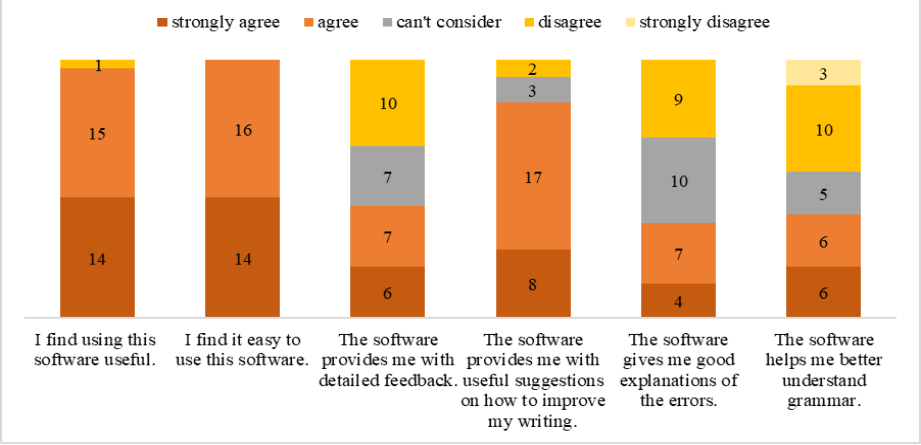
The first statement was: "I find using this software useful." Twenty-nine students (97%) chose "agree" or "strongly agree", and only one respondent (3%) chose "disagree". We could conclude that students find the software useful.

The second statement was: "I find it easy to use this software." Fourteen students (47%) chose "agree", and 16 students (53%) chose "strongly "agree". Therefore, we could say that students easily use the software.

In the 3rd statement, students should express their agreement about whether "The software provides me with detailed feedback." 13 respondents (44%) chose "agree" or "strongly agree", and seven respondents (23%) chose "can't consider", and 10 (33%) chose "disagree". It showed that there is no significant result and could depend on other causes.

"The software provides me with useful suggestions on how to improve my writing." was the 3rd statement. Twenty-five students (83%) stated that they "agree" or "strongly agree" with the 70% statement, and only two respondents (7%) chose "disagree". Consequently, we could say that most students think it provides valuable suggestions for improving their writing.

The 5th statement was: "The software gives me good explanations of the errors." 11 respondents (37%) chose "agree" or "strongly agree". Ten respondents (33%) chose "can't consider", and nine respondents (30%) chose "disagree". Therefore, there is no significant result on whether the software gives students good explanations of the errors because one-third agree, one-third disagree, and one-third can't choose.



Graph 4: Students´ attitudes towards the usefulness of software

The last statement was: "The software helps me better understand grammar." Twelve respondents (40%) chose "agree" or "strongly agree", five respondents (17%) chose "can't consider", and 13 respondents (43%) chose "disagree" or "strongly disagree". We could say that there is no clear result whether the software help to understand grammar better.

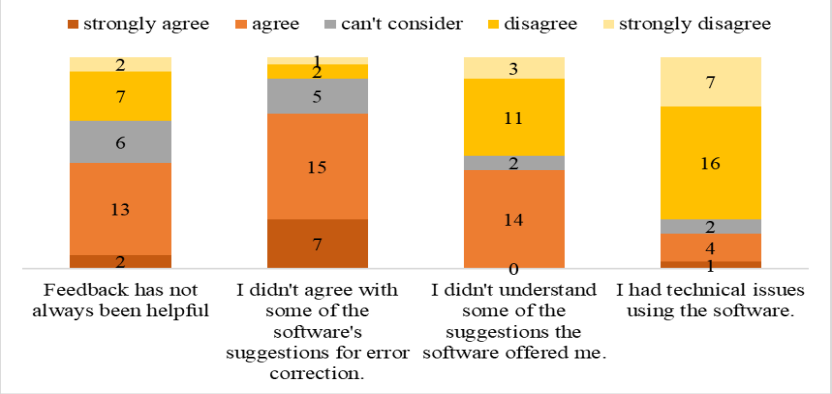
Question 10: Limitations in the use of software in learning English.

In the 10th question, we focused on the student's attitudes toward the limitations of software usage in learning English. Again, we asked students to choose a level of agreement on four statements (see Graph 5).

The first statement was: "Feedback has not always been helpful." Fifteen respondents (50%) chose "agree" or "strongly agree", nine students (30%) chose

"disagree" or "strongly disagree", and the rest, six students (20%) "can't consider". We conclude that half of the students claim that feedback has not always been helpful, which indicates that software has some limitations in the helpfulness of feedback.

In the 2nd statement, "I didn't agree with some of the software's suggestions for error correction.", Twenty-two students (73%) chose "agree" or "strongly agree", five students (17%) chose "can't consider", and three students (10%) chose "disagree" or "strongly disagree". Because most of the students did not agree with some of the software's suggestions for error correction, we could conclude that it showed that the software could have some limitations with some of the error correction suggestions.



Graph 5: The limitations in the use of software in learning English

The 3rd statement was: "I didn't understand some of the software's suggestions." Fourteen respondents (47%) chose "agree", two respondents (6%) chose "can't consider", and 14 respondents (47%) chose "disagree" or "strongly disagree". Therefore, it showed that half of the students needed help understanding some suggestions, but half did not agree with the statement.

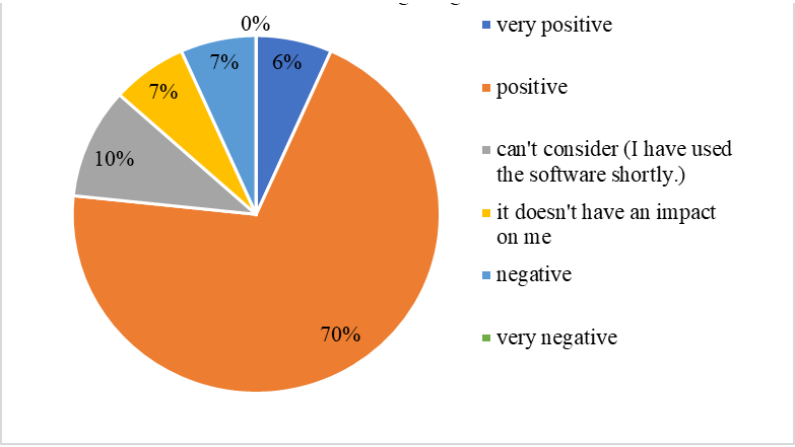
Therefore, we cannot formulate a clear conclusion.

The last statement, "I had technical issues using the software.", showed a more significant result. Five students (17%) chose "agree" or "strongly agree", two respondents (6%) chose "can't consider", and 23 respondents (77%) chose "disagree" or "strongly disagree". It indicates that most students did not have technical issues using the software.

Question 11: What effect does it have on you to use intelligent software in learning English?

Regarding the software's effect on users, we asked students to choose from the answers from the very positive to very negative impact. Twenty-three respondents (76%) chose "very positive" or positive" impact. 5 users (14%) chose

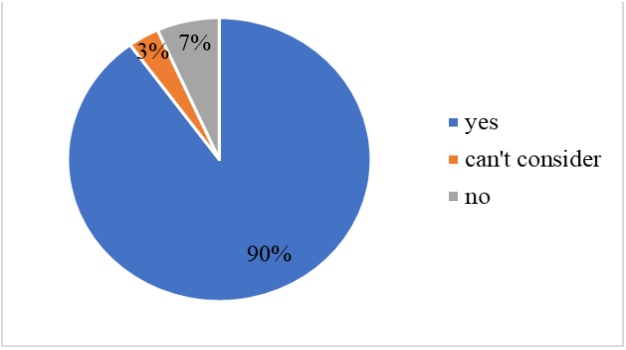
"can't consider" or "it doesn't have an impact", and only 2 (7%) chose "negative" impact. It indicated that most students consider grammar checkers valuable software in learning English (see Graph 7).



Graph 7: Recognized effects of the intelligent writing software on English learners

Question 12: Does using intelligent software give you confidence in writing in English?

In question number 15, we wanted to find out whether the software help students with confidence in writing in English. Twenty-seven students (90%) chose that using the software gave them confidence in writing in English. Only one student (3%) couldn't consider it, and two (6%) chose that using the software did not give them confidence. It indicates that, in most cases, software help students with confidence in writing in English (see Graph 8).



Graph 8: Confidence taken from using the writing software

Question 13: Would you recommend using the software?

Our study wanted to determine whether the users would recommend using the software to others in this question. 28 students (93%) chose "yes", and only 2 students (7%) chose "no". It suggests that the majority of students would recommend using some software to learn writing in English.

Research conclusions

The main goal of the empirical part was to find out the attitudes of Slovak University and High School students towards their writing skills, usage and limitations of grammar checker tools. As the secondary aims of the study, we chose to identify if the students' school, proficiency level or the area in which the student uses writing in English influence the use of the grammar checker software, to compare students' attitudes toward their writing skills in English regarding whether they used or did not use grammar checker software, to find out the reasons for the non-use of students who do not use grammar checker software, and to analyse students' opinions towards the usage of the software.

The research found that 41% (30 of 74) of our Slovak universities and High School students' respondents used grammar checker software. Students who used grammar checker software were mainly University students, chose B2 or C1 level of English, or had English writing lessons at school. It proved that the school students attended, proficiency level and the area in which they used English writing have an impact on whether the students use or do not the tools for a grammar checker. On the other hand, we focused on why 59% (44 of 74) of respondents chose not to use grammar checker software.

The answers were various. However, the most frequent responses were that they had not known any tool or they did not need any software. It showed that many tools are unfamiliar to students, or students do not consider using the software necessary.

Then, the data we received about respondents' attitudes towards writing did not show significant differences between those who use and those who do not use grammar checker software. However, the most critical differences concerned students' perception of their English grammar knowledge. The statement about the disagreement with the sentence "My knowledge of English grammar is weak." showed the difference between the two groups.

Those who used grammar checker software disagreed with 22% more respondents than those who did not. Moreover, the statement about using some help in writing in English also showed another difference. Those who used grammar checker software agreed that they use some help when they write, with about 23% more respondents than those who did not use it. On the other hand, the results of statements about satisfaction with their English grammar level or with their English vocabulary knowledge or viewing their knowledge of English vocabulary as weak were very similar or identical. However, in general, the research did not show some significant differences.

Considering the data we received from users of grammar checker software, they were mainly satisfied with the tool's usefulness. The software seemed valuable and easy for about 90% of users. Another practical characterisation for most students was that software provides useful suggestions for improving writing. However, the results of other features, such as giving detailed feedback, good explanations of the errors or if the software helps to understand grammar better, could have been clearer. Regarding the limitations of using grammar checker software, the biggest minus was that the students did not agree with some of the software's suggestions for error correction.

On the other hand, most grammar checker users did not have any technical issues with grammar checker software. They considered other limitations, such as if the feedback was not always helpful and if students did not understand some software suggestions, showing that some students agreed but also disagreed. Generally speaking, most students consider using grammar checker software positively, it gives them confidence, and they would recommend using it to others.

Discussion

In our study, we wanted to determine students' attitudes towards using grammar checker software. The anonymous questionnaire was included in the empirical part.

Firstly, we found out that from our sample of students, most of the users were University students (80%), chose B2 or C1 level of English (90%), or used grammar checker because they had English writing lessons at school (70%). Therefore, we concluded that our users had a higher level of English. Moreover, after a deeper investigation, we found that 12 (40%) out of 30 users fulfilled all three conditions. However, Chen and Cheng (2008) came up with a different conclusion about grammar checker implementation. They found out that most University students pointed out that the software could be more appropriate for students whose English level is lower.

Then, we focused on why non-users have not been using the software. Foster (2019) interviewed non-users of grammar checkers. He discovered the main reasons were technical difficulties and lack of time to use it. In comparison, our main reasons were:

Unfamiliarity with any tool, no necessity to use it, feedback from the teacher is enough, the software does not seem helpful, and non-access to any tool.

In our research, we wanted to determine whether there are differences between the attitudes to the writing of users and non-users. Cavaleri and Dianati (2016) focused on those who used Grammarly. Their findings are similar in English grammar and vocabulary knowledge and satisfaction with their grammar level. Most users among students of both groups agreed that they did not consider their knowledge of English grammar and vocabulary weak. Furthermore, half of the students in both groups are satisfied with their English grammar level.

On the other hand, the results were the opposite in terms of confidence in writing and the need for help during writing. Half of the researchers' group students did not always feel confident, and more than half did not need help, just a proofreading service. On the contrary, more than half of our respondents did not agree that they did not feel confident when they wrote in English, and half students disagreed that they did not need help. Our research also compared attitudes towards users' writing with non-users of grammar checker software.

Our research also focused on users' attitudes towards the benefits of grammar checker software. We could compare our results with Cavaleri and Dianati's (2016) study. The results were the same regarding the usefulness, ease of use and whether the software provided useful suggestions. Most students in both groups agreed that software is useful, easy to use and provides useful suggestions. However, concerning benefits, such as whether software provides detailed feedback, gives good explanations of errors and helps better understand grammar, were different. Most of Dianati and Cavaleri's group agreed, but our respondents' attitudes were less significant. Only less than half students agreed with these benefits. However, the limitations of these findings could be that not all of our respondents used the same tool.

Then we analysed the limitations of grammar checker software. Again, we could compare our data with Cavaleri and Dianati's (2016) study. The same results brought the statement about whether students had some technical issues. The majority of both groups agreed that they did not have any. However, other limitations, such as helpfulness of the feedback, agreement with software suggestions for correction and understanding of some suggestions, showed different or even opposite results. Half of our respondents stated that the feedback has not always been helpful. On the contrary, half of the researchers' respondents disagreed with it. Then, most of our respondents agreed that some of the software's suggestions were not valuable.

On the other hand, less than half researchers' respondents agreed with it. In our questionnaire concerning understanding, some suggestions did not bring clear results because half students agreed and half disagreed that some recommendations were not understandable. However, researchers' results showed a significant disagreement with it.

Again, there could be some limits because our respondents used different tools, and the researchers' respondents used only Grammarly.

Finally, we wanted to determine whether grammar checker software impacted users and gave them more confidence. Again, we could compare it with Cavaleri and Dianati's (2016) study. The results showed the same conclusions. Most students expressed that using software had a positive or very positive impact and gave them more confidence.

Pedagogical implications

Many studies done on grammar checker tools showed some similar conclusions. They recommend implementing software as a complementary element in the learning process of English as a foreign language because students can be autonomous in uploading their work and learning based on the feedback they receive from the tools.

On the other hand, it can be helpful for teachers because they can focus more on the content or organisation of the writing, and the check of issues, such as vocabulary usage, grammar or plagiarism check, can leave on the software. Moreover, it is essential to note that many researchers also remind not to forget to give a teacher's feedback to students. In addition, they also suggested that some students did not use it because they did not get instructions about the usage or did not know that some tools existed. Therefore, we would recommend that teachers notify students about grammar checker software.

Our research showed that most of our respondents who have been using the tools were satisfied with the usage, considered it easy to use, and rated it as having a positive or very positive impact on them.

After summarising some of the previous research on the usage of grammar checker software and analysing our research, we recommend using grammar checker software as a helpful tool for English learners. However, with the warning about the essential steps for the implementation. Moreover, some researchers recommend using it on their particular sample of students and their learning goals.

Conclusions

Nowadays, the application of technology can be seen in many spheres of our lives. Education, including learning and teaching, is not an exception. Teachers and students may learn how to use technological advances in everyday life. However, when they find it out, it can help them. One of these advances is using grammar checker tools because students or teachers can easily upload their works into it and quickly get feedback for their writing. In addition, this software, with a relatively long history, can scan students' mistakes in grammar, correct use of words, plagiarism, or some more language issues.

The study aimed to determine the attitudes of 74 Slovak University and High School students towards their writing skills, usage and limitations of grammar checker tools. As the secondary aim of the study, we chose to identify if the students' school, proficiency level or the area in which the student uses writing in English influence the usage of the grammar checker software. Then, to compare students' attitudes toward their writing skills in English regarding whether they used or did not use grammar checker software, find out the reasons for the non-use of students who do not use grammar checker software, and analyse students' opinions towards the usage of the software.

Firstly, we found out that 41% of our respondents used grammar checker software. However, from those who did not use it, we demonstrated that many

tools are unfamiliar to students or students do not consider using the software necessary. Moreover, based on those who used it, we proved that the school that students attended, proficiency level and the area in which they used English writing had an impact on whether the students used the tools for a grammar checker.

Then, the data we received about respondents' attitudes towards writing did not show significant differences between those who use and those who do not use grammar checker software.

Finally, we found out that students were generally satisfied with using grammar checker tools. They found it easy to use and useful for their writing check. On the other hand, regarding the limitations, the students disagreed with some of the software's suggestions for error correction. However, they would recommend using it with others.

English teacher trainees' opinions, experiences, and attitudes towards LMS Moodle

Nina Kramecová

Introduction

Thanks to the ever-growing popularity of computers, new technologies and the internet, learners are motivated to learn new languages, often using a learning method which uses these technologies as a base for their teaching process. As a result of this popularity, there is a high demand for these methods in educational environments, not only from the side of teachers but also their students, seen as they want to use the newest learning strategies in their study process. Because of these factors, using computers and the internet in the educational environment is inevitable.

In the modern age, the internet and technology play a significant role in studying foreign and second languages. Technology is often used in the process of developing suitable materials. Furthermore, it also plays a big part in delivering to the learners the materials necessary for their study. With the help of new technologies, the learning process no longer has to be tied to a classroom. Of course, this may be seen as a disadvantage since many teachers assume that new teaching technologies will eventually replace them.

Nevertheless, to make the education process of foreign and second languages as effective as possible, the new teaching methods using technology and the internet must be used alongside the methods in which a teacher is needed. From our experience working in LSM Moodle, we have noticed many of its benefits. Therefore, we were interested in other university students' opinions on this topic and to what degree their experiences differ from ours.

In the first part of this study, we focus on two modern teaching methods used during learning a foreign or second language, in which technology and/or the internet are necessary. The methods discussed in this part are CALL and e-learning. We also aimed to define the term LMS, which is very closely connected with the educational platform our research is based on. We have decided to ask future English language teachers about their opinions and personal experiences with using a teaching method based on technology and the internet. We believe this feedback can be beneficial in creating new teaching strategies to improve language learning. For this purpose, we have conducted the research presented in the second part of this study, which enabled us to discover opinions, experiences and attitudes of future English teachers towards using a specific platform, LMS Moodle, which is used in language learning. After completing the research via a

questionnaire, we analysed the collected data and compared the individual answers of the respondents, paying attention to the different faculties and grades they are studying in and the degree to which they are acquainted with the discussed platform. Additionally, we have cross-examined how the answers had differed between the respondents of various universities, faculties and studying different degrees. We were also looking for a connection between the study at a secondary school focused on information technologies and the degree of familiarity and use of LMS Moodle in the respondents' learning process. After evaluating the results, we have listed pedagogical implications for future use of the platform LMS Moodle in the education of English language and English teacher training.

Computer assisted language learning

Computer Assisted Language Learning or Computer Aided Language Learning (CALL) has been defined by Levy as "the search for and the study of applications of the computer in language teaching and learning" (Levy, 1997). It is a method used in the educational environment where computers and other ICT applications (Information and Communication Technology) are involved in helping students with the learning process. More precisely, it is used while learning a second or foreign language. Because of the fast advancements in new technologies and their popularity among younger generations, the use of computers in the educational environment is inevitable. Due to the growing popularity of new technologies, students are motivated to learn new languages using CALL. When applying the CALL method, the teacher uses computers and other technology to provide learners with study materials and feedback to promote students' learning process. Although learners can use this method to study independently, the teacher must play an active role in making the learning process as effective as possible. This can be achieved by giving the students directions on completing tasks and assisting them with problems that may arise. There are many different teaching and learning strategies included in CALL. The computer can have a teaching function when it is used for teaching a new topic or practising a skill. It can also be utilised amongst the students to research a topic or present their presentations. And lastly, the computer can be used as a communication medium by the students to connect and converse with foreign learners to practice their language skills.

Categories of CALL

According to Graham (2002), CALL can be divided into a number of categories:

1) *Traditional CALL* – in this category of CALL, a stimulus is introduced, and a reply is required; feedback is one of the frequent components of this type of CALL
2) *Explorative CALL* – in this category, the learner-centred method was opted for over the drill-based method

3) *Multimedia CALL* – the fundamental aspect of this category is role-playing; the students have the option to record themselves and play the recording as a section of steady communication with a foreign language-speaking person
4) *Web-based CALL* – with this method, students use different search engines and online dictionaries in their learning process; web-based CALL adds interactivity to the language learning process

There are three phases of CALL, which have been identified by Warschauer (1996) and Warschauer & Healey (1998): behaviourist CALL, communicative CALL and the most recent integrative CALL. Behaviourist CALL's initial stage was introduced in the 1960s and 1970s. The main idea of behaviourist CALL was that the computer took on the role of the tutor. The computer was used to deliver study materials to the students. It was based on the principle of drilling and practising information. It emphasised the importance of repeated exposure to study materials and the prosperous aspects of this exposure. Communicative CALL emerged in the 1970s and 1980s. In communicative CALL, authentic and original replies are preferred and encouraged as opposed to the required and expected responses in most language teaching methods. In this method, grammar is taught as a by-product of communication rather than the main focus of the teaching process. It creates an environment where the learner can naturally use the targeted grammar or vocabulary, and the communication and replies in it do not seem fabricated. The most recent integrative CALL impacted the 1980s and 1990s. This method combines the internet and multimedia study materials. As a result of internet use, learners can directly communicate with native speakers or other students 24/7. In this phase, people began to see computers as a source of purposeful communication (Warschauer, 1996).

CALL materials

CALL materials can be effortlessly distributed between the teacher and the students. Furthermore, it is also very easy to update them. If the information in the materials is outdated, the teacher can modernize it and distribute it to the students again. Using computers in the learning process allows learners to experience authentic language learning content and communication, which would have been very difficult to access without computers. They can learn from materials that contain everyday language and communication. For example, learners can use language exchange to experience authentic conversations with learners of different mother languages. Some of the programmes used to learn a foreign language simulate real-life situations. Students have a chance to train their language skills and, using critical thinking, connect their theoretical knowledge with practice. CALL enables teachers to use audio and video content during the teaching process. These materials are often seemed as more interesting by the learners than the traditional study materials.

Benefits of using CALL

Motivation

CALL uses content appealing to the younger generations, such as computer games. The competitiveness of these games motivates learners to focus on the activity. This encourages active learning since the learner has to use previously gained knowledge.

Other multimedia materials and communication simulations keep the student's focus, and thus students are more active as opposed to their passive learning during the traditional teaching methods. Students view the authentic materials used in CALL as more understandable and can comprehend the studied topics more quickly.

Feedback

CALL materials often offer feedback after the learner has completed a task. This feedback is sometimes given during the activity, allowing students to correct their mistakes immediately. Feedback is necessary for the learning process to be effective. It informs the learner on their progress and which aspects of the language skills they should focus on further.

Learning efficiency and effectiveness

CALL enables all the students to work at their own pace and with activities corresponding to their knowledge level. When CALL is applied in a lesson, all the students can focus on practising skills they are particularly lacking, and thus, they can all eventually reach the same level of language skills. On the other hand, during a traditional lesson, all the students are required to do the same tasks. These activities may not be challenging enough for some students and, on the other hand, can appear too difficult for others to comprehend when they are free to learn at their own pace. The learning process becomes less stressful. While completing tasks, students can ask the computer to repeat, translate or further explain information which they do not completely understand. Using authentic materials helps learners acquire the studied language skill quicker and with less effort, making the study process more efficient and enabling the students to spend their extra time on improving the skills they are lacking.

Access

CALL materials can be accessed anywhere and anytime. For this reason, people who no longer attend a school or cannot afford to attend can freely obtain study materials and learn individually at a convenient time. Using a computer and the internet, teachers can also provide materials to students absent during the lesson. Due to this, students can access the lessons they missed. Furthermore, they can repeatedly access the course materials when studying for an exam.

Individualization

Learners' learning process during CALL is more autonomous. As is already mentioned above, they can learn at their own pace. Students can also learn using a learning style suitable for them since everyone uses a different learning technique. They may discuss personally interesting topics, further motivating them to learn

the subject. This aspect of CALL teaches the students to be more self-sufficient and, in addition to that, encourages their independent thinking.

Drawbacks of using CALL

Even though CALL can be a very valuable method to promote students' language learning, new technologies and computers needed to apply CALL can be expensive. Many schools do not have enough resources to obtain these new technologies, so they rely on traditional teaching methods. An additional aspect that can make work with CALL problematic is that not all students and teachers have the necessary computer skills to effectively apply and use CALL in their classroom. In this case, the teacher can choose to include some aspects of CALL in the traditional teaching methods, which do not require advanced computer skills.

E-learning

E-learning is an umbrella term used for many teaching methods of online learning. It is a learning method which is ¨supported by electronic media and information and communication technologies (ICT) in education¨ (Šimonová, 2014, p 7). It is an innovative way to mediate a high-quality interactive learning environment. When applying e-learning, teachers distribute study materials to the learners via the internet, or the learners use the internet individually to access learning materials. It is similar to other methods in which technology and the internet are applied. Like CALL, e-learning can transpire in or outside of the classroom. Often, e-learning is incorporated into the traditional teaching method. This is called blended learning or b-learning (Šimonová., 2014).

The beginning of the use of e-learning was in 1997, making this term relatively new. Before e-learning, other terms were used, such as Internet Based Training, Online learning or Computer Based Training.

Forms of e-learning

Although they are all focused on education, e-learning has multiple forms, based on which it can adapt according to the individual requirements of students, groups, employees or companies. A mutual feature of these forms is their ability to provide information in an electronic version. Individual forms of e-learning have their specific characteristics, merits and demerits.

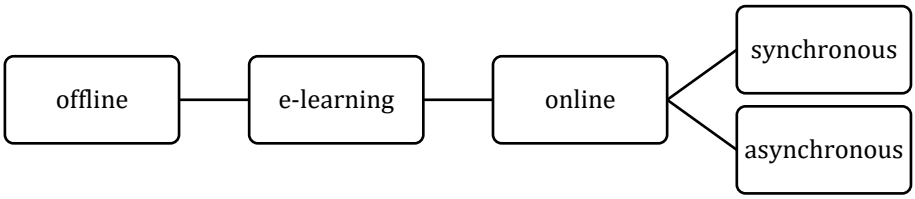


Figure 1: Forms of e-learning (based on Kopecký, 2006)

Offline e-learning – In this form of e-learning, the computer does not necessarily have to be connected to the internet. Study materials can be in the form of CDs, DVDs, Flash drives or external storage drives. This type of e-learning is often used in home study (Rohliková, Vejvodová, 2012).

Online e-learning – unlike the previous form, online e-learning requires an internet connection. Study materials are transmitted through the internet, so there is no need to download them. Online e-learning is further divided into asynchronous and synchronic e-learning. In asynchronous e-learning, student and teacher communicate during different periods. On the other hand, in synchronic e-learning, student and teacher communicate in real-time (Rohliková, Vejvodová, 2012).

Advantages and disadvantages

All forms of learning have their advantages and disadvantages. However, e-learning is one of the newest forms of education and is based on the use of ICT. It, too, has its pros and cons. Information technology specialists and educators were involved in its making and are still trying to increase its quality. The modern form of e-learning comprises the latest technologies and current information in various subjects.

Advantages

- Unlimited access: As already mentioned above, e-learning, similar to the CALL method, enables the materials and content to be accessed anytime and anywhere. This way, students can repeatedly complete previous tasks for revision or revise content discussed during the lesson and study at their own pace. The effortless accessibility of the e-learning content means less time needed to access the study materials and lower cost. Furthermore, the study materials can be distributed to more learners than without e-learning.
- Updated materials: E-learning materials always contain the latest information on the given topic since the course creator can update them according to the current trends and research.
- More appealing: The learning process can be more interesting using multimedia technologies. For example, they were adding videos or games to the learning materials. These multimedia study materials make learning easier since the learner uses their sight and hearing.
- Feedback: The teacher can check the students' knowledge and give them the feedback needed to make the learning process more effective with online tests.

Disadvantages

High costs: The software needed to apply e-learning effectively is often expensive, and creating online courses can be very time-consuming. Because of their price, these courses are not suitable for self-study.

- Dependency on technologies: E-learning depends on technologies and internet access, which can be difficult for learners without efficient funds for buying these devices.
- Computer skills are necessary: The content creator and the learner must have a certain level of computer skills to utilize the offered advantages of e-learning fully. Lack of this skill can delay the learning process and the achievement of the desired level of knowledge.
- Inability to use e-learning in all subjects: Not all subjects can be taught with the use of e-learning, such as the ones where practical training is needed.
- Absence of social interaction: When using e-learning, there is a lack of social interaction between the students and the teachers, which can affect their learning process.
- Not suitable for all learners: This learning method is unsuitable for learners who lack self-motivation to learn the subject. Additionally, e-learning courses cannot be adapted to the special needs of some learners, such as hearing or sight-impaired students**.**

B-learning

Today, blended learning represents a trend which uses multimedia and computer applications in traditional teaching. It is viewed as an accessory that makes education more attractive but does not necessarily affect methods used in the educational process. B-learning has the advantages of e-learning without the disadvantage of lacking interaction between teachers and students. The teacher can explain the topic with the related vocabulary or grammar and give the necessary instructions, and the learners can individually practice their skills using the computer afterwards.

Learning management systems

Due to the growing need to distribute study materials to learners through the internet, many systems were created that enable users to share content with other users. Before Learning Management Systems (LMS), there was a high demand for Course Management Systems and Web-Based Training. After the discovery of many shortcomings of these systems, Learning Management Systems were created. The abbreviation LMS stands for Learning Management Systems. Learning management systems are special software that manages to learn with the help of web technologies. It is a set of tools which enable the production, management and use of courses in an electronic environment. Furthermore, LMS contains tools for communication and evaluation of achieved success and results. LMS create a platform exclusive for students and teachers from a particular institution. Generally, to access content from this platform, participants must use a log-in information provided by their institution. Afterwards, they can share study materials, announcements, instructions, and submitted completed tasks. LMS can also store students' statistics, multimedia study materials or conduct an online

exam (Ülker & Yilmaz, 2016). Every LMS contains a package of tools necessary for the proper functioning of the system:

- creation and management of a course
- verification and feedback
- administration of a course
- standardization
- communication
- evaluation (Dillingerová, 2007)

Components of LMS

Standard components of LMS are elements which are required for the basic operation of a course. Thanks to these elements, a user can log into a course or the administrator or a teacher can create a new course. Standard components of LMS are:

- registration of a user; storing personal information; providing username and a password
- registration of a course; storing information concerning the courses; length of study
- the creation of roles and their administration, i.e., teacher, student
- tracking the progress of a learner (Turek, 2008)

LMS at universities

The use of Learning Management systems is very popular in universities in Slovakia and worldwide. They are designed to enable the delivery of courses, study materials and additional multimedia or interactive materials. Although this is most appealing to younger students, even university students appreciate using these materials, which can make the study process less tedious and make the information easier to remember. Universities use LMS systems alongside traditional teaching methods. They often focus lectures and seminars on the important aspects of the subject or topic they teach their students. In addition to this, they use LMS platforms to create assignments that students can do at home. Although these tasks are often with a deadline, the students have enough time to complete them at their own pace, which makes their learning more effective. After completing these assignments, teachers can leave feedback so the students can fix their mistakes. This makes their learning more efficient. This feedback also helps universities store and track the students' progress and achievements. A feature which the students and university teachers very appreciate is LMS's flexibility and easy access.

Latest research results

This chapter of our study is focused on summarizing two latest research results regarding the topics described in this work. These results will later be compared to the results of our own research.

The impact of web-based lecture technologies

The study which will be discussed here was supported by the Carrick Institute for Learning and Teaching in Higher Education Ltd (now known as the Australian Learning and Teaching Council) were conducted by a project team of members from various universities in 2006. Most of the respondents were students of an undergraduate degree. The research proved that the overall experience with using Web-Based Lecture Technologies (WBLT) were often positive. When asked about their experience, most of the respondents answered that the use of WBLT can be beneficial in achieving better results and making learning significantly easier. The researchers also found out that the use of WBLT is preferable by the students in combination with traditional lectures or to access missed lectures. Most respondents use WBLT to revise materials for exams or take notes during lectures. The asked students liked the option to access study materials online but also liked attending the lectures, as it allowed them to keep in contact with their classmates. External students who participated in the study considered using WBLT as a tool to connect with their teachers and classmates and reduce their feelings of isolation. The study proved that WBLTs are beneficial when they are used to support traditional teaching methods or as a tool to support external students. When used incorrectly, WBLT can disrupt the learning and teaching process (Gosper, Green, McNeill, Phillips, Preston, Woo, 2006).

The use of Moodle

Another research by S. Suppasetseree and N. Dennis, published in the International Journal of the Humanities in 2010, looked at students' opinions regarding using Moodle in learning English. The name of the published work is The Use of Moodle for Teaching and Learning English at Tertiary Level in Thailand. Most of the respondents agreed that they could easily access Moodle from home and the classroom. They consider its website trustworthy, quick, easily navigated and well-structured. They also shared positive experiences with communication through Moodle. Most students agreed that Moodle helps make learning more effective by using its provided services. The respondents had very good experiences with the resources and materials accessed by Moodle. The study revealed that most of the students asked would like to continue using Moodle and that it improved their learning process. To use Moodle properly, the students agreed they had to practice discipline and computer skills, and its online use made them feel more confident (Suppasetseree, Dennis, 2010).

RESEARCH

Aims of the study

The main goal of this study was to find and compare the opinions and attitudes of students from various Slovak universities studying English teaching regarding the use of LMS Moodle in the foreign language teaching process and English

teacher teaching. Furthermore, we aim to collect their individual experiences and opinions with learning in LMS Moodle. Based on the primary goal of this study, we have determined our secondary aims.

Secondary aims of this study are:

- To compare opinions, attitudes and experiences of students from different faculties regarding the use of LMS Moodle in teaching English as a foreign language as well as in English teacher training.
- To compare opinions, attitudes and experiences of younger and older students in regard to using LMS Moodle in English teacher training and in teaching English as a foreign language.
- To find out to what degree are the students of Slovak universities familiar with the term LMS Moodle and to what degree do they use LMS Moodle in their learning process.
- To find out what the Slovak university students consider the most significant advantages and disadvantages of using LMS Moodle in English teacher training as well as in teaching English as a foreign language and whether they consider its use as beneficial.

Research questions

1) What are the attitudes of Slovak university students towards LMS Moodle and the use of this platform in the teaching process of English as a foreign language and English teacher training?
2) To what extent are the students of Slovak universities acquainted with LMS Moodle?
3) How do the asked students rate their experiences with working in LMS Moodle to acquire their English language and teaching skills?

Characteristics of the respondents

The respondents of our research are 50 students above 18 years old studying English teacher training at universities in Slovakia. Most of the respondents are studying English teacher training at the faculties of education. A smaller number of respondents are students of faculties of philosophy, faculties of humanities and natural sciences faculties. The first five questions of the questionnaire were focused on obtaining the demographic data of the respondents.

Question 1 revealed that 100% of the respondents were students studying in Slovakia.

Question 2, which was focused on the gender of the respondents, showed us that 74% of the respondents (37) were female, and 26% (13) were male.

Question 3 revealed that 33 of the respondents (33%) were students of bachelor's degree, 12 respondents (24%) were students of master's degree, four respondents (8%) were students of doctoral degree and one of the respondents have already finished their study.

Question 4 told us that most of the respondents were students of the faculty of education, with Thirty-one students (62%) chose this option, 13 students (26%) were students of faculty of philosophy, 5 (10%) were students of the faculty of humanities, and one respondent was a student of the faculty of natural sciences.

Question 5 asked the respondents whether they studied at a secondary school focused on information technologies. 42 respondents (84%) had not studied at this type of school and eight of the respondents (16%) answered yes.

The questionnaire was shared on the social media pages of numerous faculties. These faculties were the faculties of education at Trnava University and Comenius University, the faculty of philosophy and natural sciences at Matej Bel university, the faculty of humanities at The University of Žilina, faculty of philosophy at the University of Prešov. The respondents from these faculties were students of the study program teaching English language and literature and teaching English language and literature in combination with another subject. As the survey was also shared at a site for all Slovak university students, we cannot be certain whether students from other universities participated in the research.

Characteristics of LMS Moodle

Moodle, an acronym for Modular Object-Oriented Dynamic Learning Environment, is a Learning Management System software used by many universities, foreign as well as Slovak. Educators use it to create online courses. Moodle is a free, open-source software, meaning people can freely use it and modify it how they see fit. Because of this, the software continuously develops to accommodate its users' requirements. Moodle gives access to ¨virtual classrooms¨ that users can access through the internet with the help of standard search engines. Students use this platform to access online courses and study materials. Teachers use this platform to post and collect assignments and conduct exams.

Some of the many advantages of Moodle are:

- its free access
- online accessibility
- simple updating
- its translations to many languages, including Slovak and Czech
- it contains many colourful themes with the option to create your own
- it is possible to create study materials offline and later upload them to Moodle

Research method

Based on the study's primary and secondary goals, we decided to choose the method of an anonymous questionnaire to conduct our research. The questionnaire was created using the online program ¨Google forms¨. The questionnaire was distributed via email and social networks and was completely anonymous without any time limit. The requirement for the respondents was that they are students of English teacher training, and their age is higher than 18. To secure a large variety of responses, this questionnaire was answered by 50

students studying English teacher training in various Slovak universities and different faculties. The research was conducted in the months of March and April 2022. The survey was conducted in the Slovak language and contained 21 questions. Five focused on demographic data. The questionnaire mainly contained closed questions with the option of only one answer and questions with a scale from 1 to 5, where the respondents rated their experience or degree to which they agreed with the given statement. If the respondents could not find the correct answer, they could create their own. We evaluated the obtained data in the following charts.

Research results

After conducting our research, we analysed and compared the obtained data. In this part of our study, we have listed our survey results. All of the answers were interpreted into charts and evaluated in per cent. In questions asking respondents to rate their experiences and opinions, we have compared the average ratings of students from individual faculties.

Question 6: Do you know what is LMS Moodle?

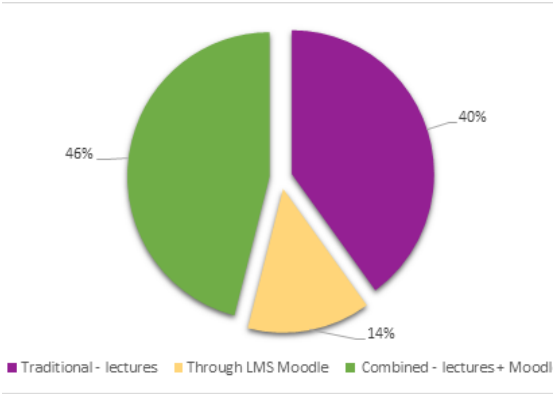
The respondents were asked whether they knew LMS Moodle. Forty-nine of the respondents (98%) answered yes, and one respondent did not know what LMS Moodle is. This indicates that most of the students at Slovak universities are familiar with LMS Moodle.

Question 7: Do you use Moodle for your studying?

Forty-eight students (96%) responded that they use Moodle in their study, and two respondents (4%) answered that they do not use Moodle. This question told us that most students at Slovak universities actively use LMS Moodle to help them with their studies. It also proves that this platform is widely used by Slovak universities, which may result from its many advantages.

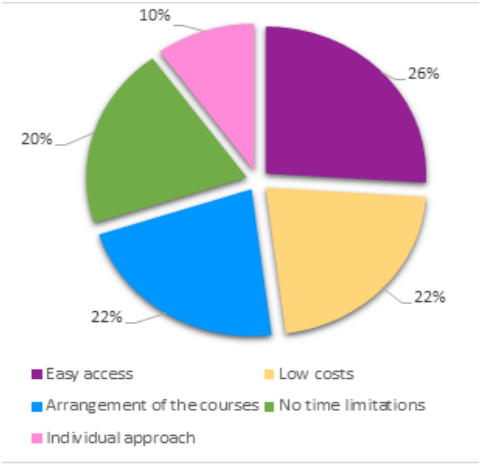
Question 8: Which form of teaching do you prefer?

Most of the asked students prefer a combined form of teaching (lectures + Moodle), with 23 students (46%) choosing this option, and the traditional teaching method (lectures), with 20 respondents (40%) opting for this answer. Seven students (14%) prefer learning through LMS Moodle only. This demonstrates that students find the combined method (lectures + Moodle) to be the most effective in helping them achieve their skills.



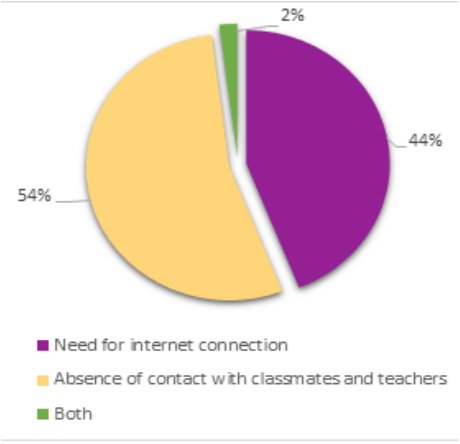
Graph 1: The preferred form of teaching

Question 9: What do you consider as the biggest advantage of LMS Moodle?
Regarding the biggest advantage of using LMS Moodle in education, generally, the most preferred answer was its easy access, with 13 students (26%) choosing this option. The second most liked advantages were its low costs and arrangement of the courses, where both options received votes from 11 students (22%). Ten respondents (20%) consider no time limitations as the biggest advantage of Moodle, and five students (10%) answered that it is its individual approach.



Graph 2: The biggest advantage of Moodle

Question 10: What do you consider as the biggest disadvantage of LMS Moodle?
The majority of the respondents, 27 students (54%), consider Moodle's most significant disadvantage to be the absence of contact with classmates and teachers. Twenty-two students (44%) think it is a need for an internet connection. One respondent chose the answer "other" and said it is both. This indicates that although English teacher trainees find the use of LMS Moodle beneficial for their study, the lack of contact with their classmates and the inability to access the courses without an online connection is considered very significant disadvantages.



Graph 3: The biggest disadvantage of Moodle

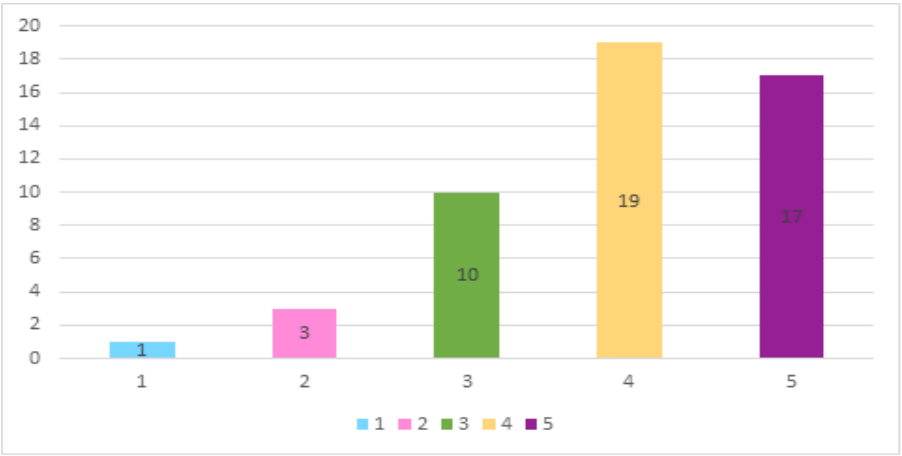
Question 11: What advantages do you see in using LMS Moodle in teaching English as a foreign language?
In this case, we asked the students an open-ended question, where they could write what advantages they see in using LMS Moodle in teaching English as a foreign language. The most popular answer to this question, with 20% of respondents opting for it, was Moodle's ability to access study materials anytime from anywhere and repeatedly access materials to revise for an exam. Additional

frequent answers were the wide variety and diversity of the available sources and the option to switch the courses and materials into a different language and, further, to also change the language in which the students can view the Moodle site. What many students also consider as an advantage of Moodle is the option to work at their own pace without the need to follow a schedule assigned by their school. All three of these frequent answers were given by 10% of the respondents. Some of the respondents listed the following aspects as the advantages of using LMS Moodle: its individual approach; the necessary use of creative thinking; the option of the teacher to provide feedback on the completed tasks; the possibility to conduct an exam or a test without having to travel to school; the growing attractiveness of the online sphere; the simplicity of the tasks and their easy revision; it promotes independence and individuality; it helps students develop or improve their computer skills, which may prove to be beneficial in their future careers.

Question 12: How would you describe your experience with testing and/or examination through LMS Moodle?

On a scale from 1 to 5, where one is very bad and five is very good, 17 students (34%) rated their experience with testing and/or examination through LMS Moodle as very good, 19 students (38%) rated it as good, ten students (20%) as neutral, three students (6%) as bad and one student rated it as very bad. These results signify that the respondents' experiences with examinations conducted through LMS Moodle are mostly good.

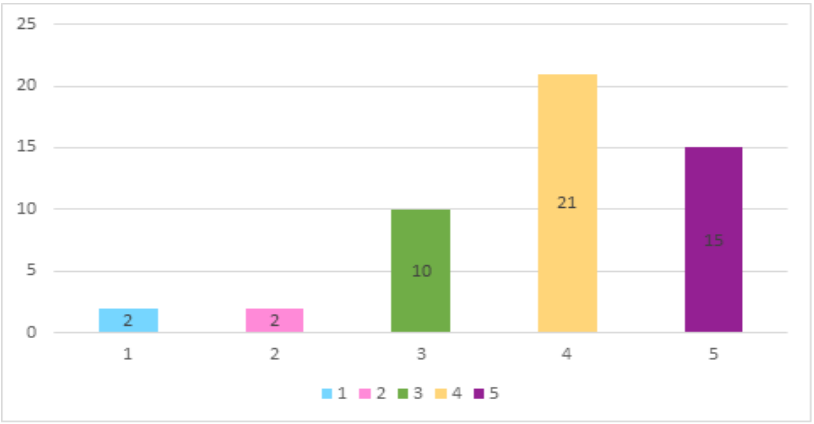
The average rating according to the different faculties is faculty of philosophy – 4,15; faculty of education – 3,9; faculty of humanities – 3,6. There were not enough respondents from the faculty of natural sciences to correctly evaluate the answers. As is evident from the results, students of the faculty of philosophy have the best experience with examinations or testing through LMS Moodle.



Graph 4: Experience with testing through Moodle

Question 13: How would you rank the use of LMS Moodle on universities in training future English teachers?

On a scale from 1 (very bad) to 5 (very good), 15 students (30%) rated the use of LMS Moodle on universities in English teacher training as very good. Twenty-one students (42%) said its use is good, ten students (20%) were neutral in their answers, two students (4%) rated it as bad and another two respondents (4%) as very bad. These answers show that most students consider their experiences with using Moodle in English teacher training as good, with a minimal number of students having bad or very bad experiences. Individual faculties rated the use of LMS Moodle in English teacher training followingly: faculty of humanities – 4,6; faculty of philosophy – 4,07; faculty of education – 3,7.



Graph 5: The use of Moodle in English teacher training

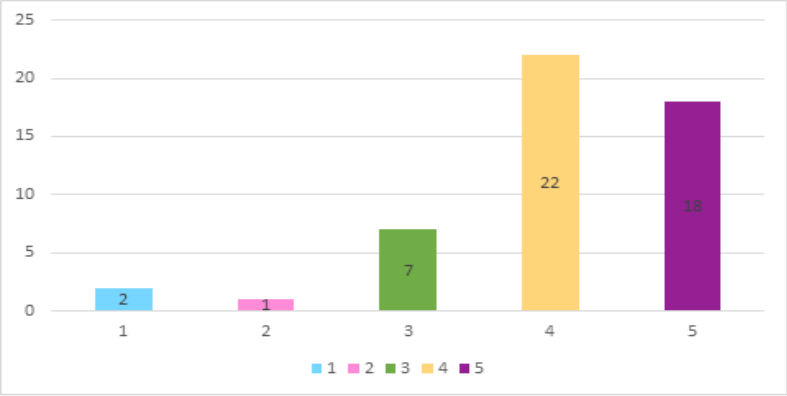
Question 14: How would you rank the use of LMS Moodle in teaching English as a foreign language?

On a scale from 1 (very bad) to 5 (very good), 18 respondents (36%) said the use of LMS Moodle in teaching English as a foreign language is very good. Twenty-two students (44%) rated it as good; 7 students (14%) were neutral on the subject, one student rated it as bad, and two respondents (4%) said it was very bad. This indicates that the student's experiences with using LMS Moodle in teaching English as a foreign language are better than their experiences in English teacher training. The use of LSM Moodle in teaching the English language gained the highest average rating from the respondents of the faculty of philosophy – 4,38; and lower ratings from the faculty of education – 3,96; and the faculty of humanities – 3,8.

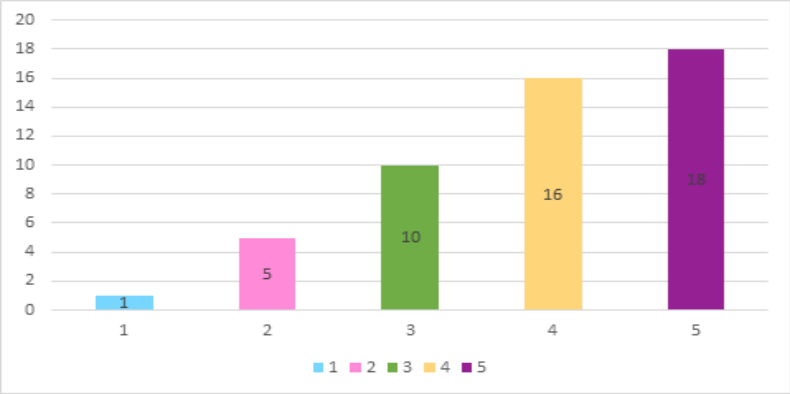
Question 15: I think that education in LMS Moodle helps reach better results in teaching English as a foreign language.

On a scale from 1 (totally disagree) to 5 (totally agree), 18 students (36%) answered that they totally agree with the statement that LMS Moodle helps reach better results in teaching English as a foreign language (see Graph 6). Sixteen

students (32%) said they agreed with the statement, ten students (20%) were neutral in their answer, five students (10%) disagreed, and one student totally disagreed. These results prove that most respondents consider LMS Moodle to help reach better results in teaching English as a foreign language. The impact of LMS Moodle on achieving better results in teaching the English language received the highest rating by the students of the faculty of philosophy with an average of 4, followed by the faculty of education – 3,9 and faculty of humanities – 3,8.



Graph 6: The use of Moodle in teaching English as a foreign language

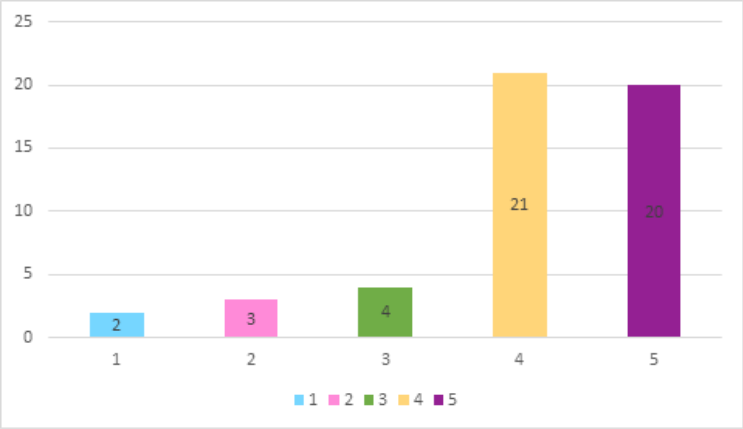


Graph 7: Opinion on the impact of Moodle on the results in teaching English as a foreign language

Question 16: I think that education in LMS Moodle is beneficial in English teacher training.

On a scale from 1 (totally disagree) to 5 (totally agree), 20 students (40%) fully agreed with the statement that LMS Moodle is beneficial in English teacher

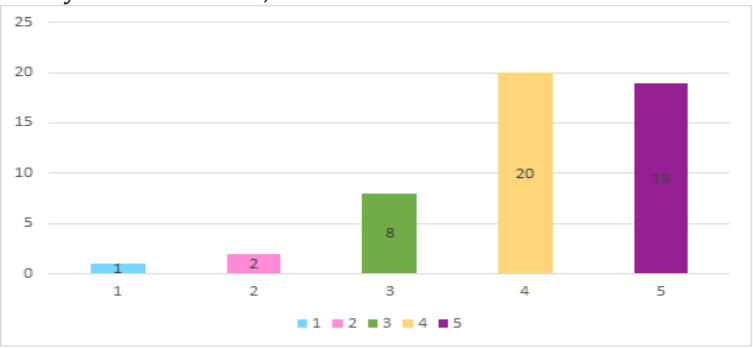
training. Twenty-one students (42%) agreed, four students (8%) were neutral, 3 (6%) students disagreed, and two students (4%) fully disagreed. The students' responses show that they consider using LMS Moodle in English teacher training very beneficial, with 82% of the respondents agreeing or fully agreeing with the given statement. Students from a faculty of education gave the given statement an average rating of 4,12; students from faculties of philosophy and humanities rated the statement with an average of 4.



Graph 8: Opinion on the benefits of Moodle in English teacher training

Question 17: I would like to continue using LMS Moodle.

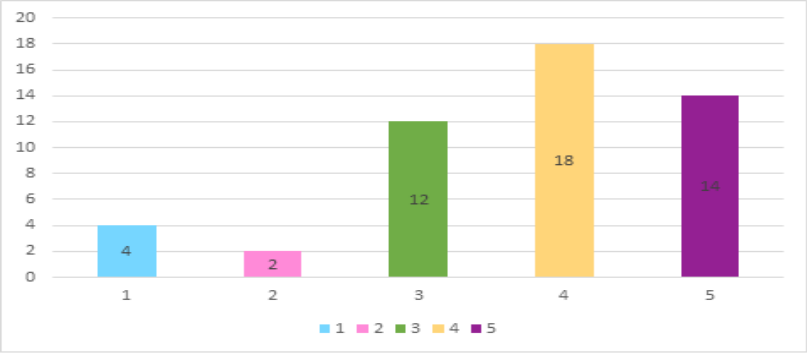
On a scale from 1 (totally disagree) to 5 (totally agree), 19 students (38%) totally agreed that they would like to continue using LMS Moodle. Twenty students (40%) agreed, 8 (16%) responded neutrally, two students (4%) disagreed, and one respondent fully disagreed. Although many of the students were neutral when asked whether they would like to continue using LMS Moodle, the majority would prefer to use it in the future. The average rating according to the individual faculties was as follows: faculty of philosophy – 4,3; faculty of humanities – 4; faculty of education – 3,96.



Graph 9: Opinion on the future use of Moodle

Question 18: I would like it, if LMS Moodle was used more in learning English language.

On a scale from 1 (totally disagree) to 5 (totally agree), 14 respondents (28%) fully agreed that they would like it if LMS Moodle was used more in teaching the English language. Eighteen students (36%) agreed, 12 students (24%) were neutral on the subject, two students (4%) disagreed, and four respondents (8%) answered that they fully disagreed.

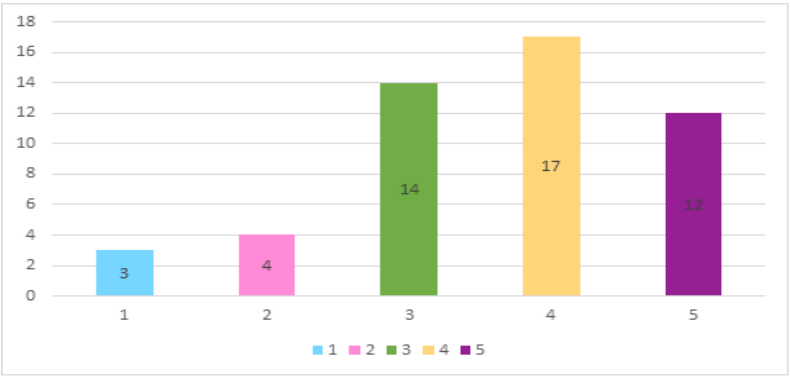


Graph 10: Opinion on the extended use of Moodle in learning English

Most respondents have a good attitude towards using LMS Moodle in learning the English language and would like to continue with its use or are of a neutral opinion regarding the subject. This statement received an average rating of 4,15 from the students studying at the faculty of philosophy, 3,8 from students at the faculty of humanities, and 3,54 from students from the faculty of education.

Question 19: I would like it, if LMS Moodle was used more in English teacher training.

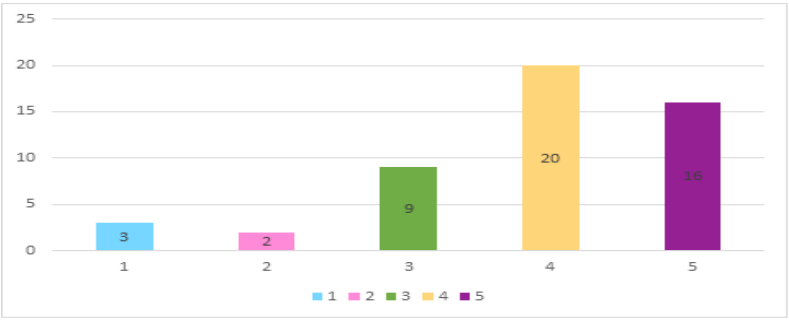
On a scale from 1 (totally disagree) to 5 (totally agree), 12 students (24%) said that they fully agreed with the given statement and that they would like it if LMS Moodle was used more in English teacher training. Seventeen respondents (34%) agreed, 14 students (28%) gave a neutral answer, four students (8%) disagreed, and three participants (6%) fully disagreed. Although a significant number of the respondents fully agreed that LMS Moodle should be used more in English teacher training, the majority of students agreed or were neutral on the subject. If we compare the opinions of students from different faculties, this statement received an average of 4,07 from the faculty of philosophy, 3,8 from the faculty of humanities, and 3,38 from the faculty of education.



Graph 11: Opinion on the extended use of Moodle in English teacher training

Question 20: I think that every school should use LMS Moodle in teaching English language.

On a scale from 1 (totally disagree) to 5 (totally agree), 16 respondents (32%) totally agree with the sentence stating that every school should use LMS Moodle in teaching the English language. 20 students (40%) agreed, nine answers (18%) were neutral, two students (4%) disagreed, and three respondents (6%) totally disagreed. These results show that most of the asked students fully agree or agree with the use of LMS Moodle in teaching English at every school and a significant number of the respondents answered neutrally. The respondents studying at a faculty of philosophy rated their agreement with the statement with an average of 4,3; a faculty of humanities 3,8; and a faculty of education 3,41.

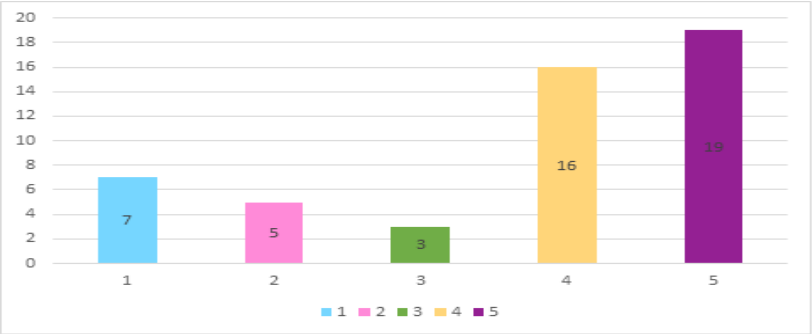


Graph 12: Opinion on the use of Moodle at every school

Question 21: I often use LMS Moodle to research study materials.

On a scale from 1 (totally disagree) to 5 (totally agree), 19 students (38%) answered that they fully agree with the sentence stating they often use LMS

Moodle to research their study materials. 16 students (32%) agreed, three participants (6%) responded neutrally, five students (10%) disagreed, and seven respondents (14%) fully disagreed. These answers revealed that although a majority of the respondents use LMS Moodle to research their study materials often, 24% of the students disagreed with the statement. Additional analysis of the results showed that, on average, students of the faculty of philosophy rated this statement with the number 3,76; students of faculty of education with 3,41; and the students of the faculty of humanities with 3,2.



Graph 13: The use of Moodle to research study materials

Research conclusions

The aim of one of the questions focused on demographic data was to determine whether the students who studied at a secondary school focused on information technologies were more familiar with Moodle and used it more extensively. As most of the respondents were not students of such schools. There seems to be no connection between this type of secondary school and the student's knowledge and familiarity with Moodle. Almost all the students asked were familiar with Moodle and used it to study. This indicates that Slovak universities actively use this platform. The data from this research demonstrates that although e-learning methods and platforms connected with them are proving to be reliable and very popular, students find the combined method (lectures + Moodle) the most effective. A lower number of students prefer the traditional approach (lectures), and teaching exclusively through Moodle is the least popular

among Slovak university students, which may be the result of its most significant disadvantage, the absence of contact with other people. Students consider the most important advantage of using Moodle is its easy access. On the other hand, the results revealed the lack of contact with the teacher and classmates to be the most significant disadvantage. When the respondents were asked to list what they considered an advantage of using Moodle in teaching English as a foreign language, the most common answer was that it provides easy access to the study materials and enables the users to repeatedly access materials and courses.

Overall, the student's experiences with exams and tests conducted through Moodle were good. There was a minimal number of students rating their experiences negatively. Most students agree that using Moodle helps achieve better results in teaching English and that its use can be beneficial in English teacher training. The most common answer from the respondents when rating their agreement with the statements regarding the use of LMS Moodle and their experiences and opinions about its future use was 4, which reveals that although the majority of the students are content with its use, the use of LMS Moodle could be improved.

When comparing the opinions of students from different faculties, the overall experiences with the use and opinions regarding the future use of LMS Moodle in teaching English as a foreign language and in English teacher training were more positive from the respondents studying at faculties of philosophy. On the other hand, the more negative ratings on the statements given in the survey were by the students of faculties of education and faculties of humanities. The doctoral degree students rated their experiences with Moodle higher than those of bachelor's and master's degrees. The students of bachelor's degrees rated their experiences with the lowest average compared to the other degrees.

Discussion

Aside from conducting our own research, we have compared the obtained data with two studies which researched similar topics. In the theoretical part of this study, we have summarized the conclusions of these studies. Regarding the experiences of using Moodle in learning, we obtained similar ratings, the majority of which were positive. Our respondents also had matching opinions with the other studies regarding their future use of Moodle. Most of our research respondents and those from two different studies agreed that using Moodle helps them achieve better results in their learning.

Additionally, respondents from one of the studies agreed that using Moodle helps them improve their computer skills and makes them more confident and disciplined. Moodle’s advantages and disadvantages were similar in all three works. The students like Moodle’s easy access and the arrangement and layout of the courses.

Although our respondents considered the most significant disadvantage to being its lack of social contact, respondents from one of the studies, who study externally, agreed that, on the contrary, Moodle enables them to preserve their contact with classmates and also makes communication with the teachers easier.

Pedagogical implications

The research results show that students have good experiences with the use of LMS Moodle in the education of English as well as in English teacher training. Almost all respondents use Moodle in their learning, and the majority would like to continue with its use. Even though teachers may not have any evidence of

Moodle helping their students improve, the respondents agreed that this platform helps achieve better results and is beneficial for their education.

Although Moodle, and e-learning in general, still has some disadvantages, its proper use in combination with the traditional teaching methods makes learning a foreign or second language more effective. The respondents were able to list many advantages and benefits. Therefore, the use of Moodle in the education of English and teacher training would bring positive results.

The research implies that there are numerous effective ways to use Moodle in teaching English language and in English teacher training. Teachers can use the platform to distribute materials to the students ahead of the lesson to get students familiar with the topic.

Moodle can also be used as a storage space for past lessons. This function enables students to revise or access older study materials. The teacher can send students assignments through Moodle and put all their focus during the lesson on explaining the subject. Furthermore, the teacher can send additional materials and voluntary assignments for students who wish to learn the topic more elaborately. It can also be used as a platform for communication between students and teachers. Due to these facts, we believe that every school should try to implement LMS Moodle, or a platform to it similar, into their teaching processes.

Digital Tools for Building Vocabulary in English Language Learning

Dominika Matulová

Introduction

Vocabulary is one of the essential parts of the language. "It is the basis for developing all the other skills: reading comprehension, listening comprehension, speaking, writing, spelling, and pronunciation "(UKEssays, 2018).

Knowing grammatical rules is irrelevant without sufficient vocabulary. In the past, without technology, learners often used memorization reinforced by textbooks to acquire language. With the advent of technology, vocabulary learning techniques and tools are advancing. Textbooks, place, and time no longer limit learners from learning vocabulary. Technologies are still evolving at a relatively high speed, creating new learning opportunities. However, with the students' positive attitude towards them, the effort of developers would be well-spent, and CAVL would be successfully adapted. Much research has been conducted since the appearance of computerized vocabulary learning; therefore usefulness of similar research can be questioned. Generations after generation, people change, and everyone's cultural background and experiences may differ. Also, new technologies are introduced every year. Therefore, other research, even if similar to existing ones, might prove useful and bring interesting insights into students' attitudes.

In this paper, the researcher would like to explain what vocabulary is, discuss teaching and learning vocabulary and the most used vocabulary teaching and learning methods, present CAVL, its advantages and disadvantages and existing tools in the theoretical part, and investigate students' attitudes towards CAVL, what influences their attitudes, and whether learners prefer some tools.

Teaching and learning vocabulary

Before starting a discussion about teaching and learning vocabulary, defining what vocabulary is might be helpful. Cambridge dictionary (online [Undated]) defines vocabulary as “all the words that exist in a particular language or subject”. Pokrivčáková (2014, p. 24) describes vocabulary as “a sum of all words that a language consists of.”. She also recognizes another meaning of the word, which is “the set of words a particular person can use in communication (ibid.)”. Alfaki (2015, p. 1) expands on this definition by adding that vocabulary “includes single items and phrases or chunks of several words which covey a particular meaning”.

Frequently used vocabulary teaching and learning methods

Different methods and reinforcement tools have been developed and used to learn and teach vocabulary (Vančová, 2018; 2021c). They are shared either in literature or in various places across the internet. Pokrivčáková (2014) pointed out that these are sometimes contradictory. Therefore, it may be difficult for teachers and learners to choose which to trust and follow (Sucháňová, 2021a; 2021b). To add a new word to one's vocabulary and know it as effectively as possible, the learner needs to be exposed to it systematically and repeatedly. Spaced repetition is one of those practices that can be used to accomplish this.

Spaced repetition is a method based on a forgetting curve. The forgetting curve shows how much knowledge we acquire over time if we do not try to retain the information through repetition. Spaced repletion is the method that promotes reviewing the source one learns from with spaced intervals to improve long-term information storage. Such practices are also used in computerized language learning. Many flash cards use spaced repetition method.

Since there are technologies everywhere around us and due to the pandemic, the world has had to experience online education. We may assume that vocabulary teaching and learning reinforced by digital tools is the most popular method among teachers and learners worldwide. The COVID-19 pandemic made students and teachers switch from contact learning to online distance learning to slow down the spreading of the virus. However, there are discrepancies between this assumption and the results of the latest studies. Research by Hynam (2021) showed that although teachers attempt to make their lessons more interesting by using different sources, including vocabulary application in English vocabulary teaching, they still frequently use textbook methods.

Susanto et al. (2020) found that that EFL classrooms still implement communicative and translational methods in English language education. Even if a teacher told his class not to look up the word in the dictionary, a class reached for it to find a translation. Findings from Dekabo (2021) also stated that that definition and translation methods were included in the vocabulary teaching process that are explicit and that might encourage learners to "largely rely on incidental learning associated with online learning" (Ma, 2017, p. 47).

Wang (2016) is the only one the author of this paper encountered who said that technology is popular among teachers in teaching vocabulary. However, his claim is not supported by any other citations or research in his work, and his text is the oldest of discussed ones. Some other authors confirmed that digital tools were used in language teaching but did not mark them as the most used. Krajka (2021, p. 124) mentions that student teachers use highly interactive digital tools, for example, Kahoot and Mentimeter. However, he pointed out that these were used less "frequently than close-ended vocabulary and grammar materials". These studies generally show that digital strategies are not most used despite the pandemic. Traditional approaches are still favoured among students and teachers. As this has been observed in schools, students will likely do the same when

learning vocabulary outside school. Nevertheless, the era of online learning in 2020 – 2022 might have been a stepping-stone for implementing digital tools in English vocabulary acquisition and helped raise awareness of such options. The study from Krajka (2021) could be considered a positive outlook for the future of CAVL and its implementation.

Computer-assisted vocabulary learning (CAVL)

CAVL is a branch of computer-assisted learning known as computer-assisted language learning (CALL) which is a branch of Computer Assisted Learning (CAL) Joseph et al. (2009), which is focused on vocabulary. This definition may not be satisfactory for those who do not know what CALL is; therefore, an explanation of CALL might be needed to understand what CAVL is. An abbreviation for Computer Assisted Language Learning, CALL is a method that promotes interaction and aids students in achieving their learning objectives at their own speed and capacity (Kumar & Sreehari, 2009). They add that computers aid the whole learning process. This definition is still very broad. However, it is problematic to describe it further. Beatty (2003, p. 7) suggests that defining a model of CALL is problematic because CALL is "any process in which a learner uses a computer and, as a result, improves his or her language" (ibid.). Technology can bring huge diversity into vocabulary learning.

Because of this, various media such as films or videos, applications, blogs, podcasts, games, etc. It can be implemented into the learning process with a few clicks. According to Krois-Lindner, the internet has endless possibilities to develop coherent and fully integrated authentic materials suitable for building ESP vocabulary using ICT (2008).

As with everything, CAVL has its advantages and disadvantages that are discussed separately in the sub-chapters below.

Advantages of CAVL

First, computerized learning often provides instant feedback. Some tools even explain why something is wrong or right; if not, students can easily search for the reason on the internet.

Research conducted by Hani (2014) lists helping shy students as another advantage of CALL and, therefore also, CAVL. Shy students may be avoidant towards raising their hands and engaging in traditional language classroom activities or avoiding participation in English learning activities outside the classroom. CALL methods can help to eliminate such barriers.

There are three types of learners, and these are visual, auditory, and kinaesthetic. Traditional pen-and-paper methods could not provide a multisensory experience using sounds, videos, and instant accessibility of various pictures. Therefore, they were unable to fulfil the learners' learning potential and abilities as much as possible. Not to mention that many students have mixed learning styles. However, CALL can help to do so.

Another advantage is the creation of space for individuality. Each learner can proceed at their own pace. There is also the possibility to repeat exercises or play videos as often as the learner needs. Ahmad et al. (1985) point out that computers can offer personalized study experiences to improve learners' skills.

Due to the variety of digital tools on the internet, students can also choose activities corresponding to their preferred learning style.

CAVL can also promote autonomous learning through various English language learning. This might prove helpful for those who want to study at universities since self-study will be part of their learning journey at a university.

Lin (2010) mentions another advantage: students who learn in a CALL setting are more motivated and can get hold of learning opportunities without needing to care about location or time.

Disadvantages of CAVL

One of the most evident disadvantages of CALL and CAVL is that some require internet access that not everyone has all the time for various reasons. Another disadvantage is that using the full potential of technologies in language learning may, for some individuals require specialised training. This might be true, especially for the elderly who were not accustomed to living hand in hand with the latest technologies. Some individuals might be irritated by the need for continuous updates. Some applications need to be updated regularly to function correctly and match the latest research findings and changes in the world of vocabulary learning. Another problem is that technology can usually evaluate correctness but not appropriateness. We may need to use different vocabulary in various contexts. Lately, the application named Grammarly has been trying to do so, but there seems to be a long way to go for it always to get the suggestions right. (Lai & Kritsonis, 2006, p. 4) add that "computer technology along with its artificial intelligence will not be able to manage and deal with unexpected questions students might encounter."

Dimattia and Gips (2004) are concerned that the inclusion of computers might increase education costs. Even though many things changed, now decent devices can be bought for relatively low prices. In years to come, when more complex tools will be available for language acquisition and higher processing power, better processor and graphics cards might be needed, and expenses might burden users again.

Summary of existing CAVL tools

Pokrivčáková (2014, p. 26) explains that digital vocabulary teaching tools "introduce or exercise foreign vocabulary in three main contexts," and these are "visual, semantic and interlingual" (ibid.). She then points out that there is also a textual context which frequently does not occur and is "usually more focused on developing general reading comprehension skills than on vocabulary development" (ibid.).

Visual context

Vocabulary development aided by visual depictions of words is believed to be the most authentic and valid. They "create a visual link between a new word and its meaning" (FluentU, [Undated]). Nation (2001) states that the word's meaning may change during communication that aims to make the message more visible form. Using pictures can help us to avoid such problem. Recently, augmented reality has been introduced into vocabulary teaching (VocabGO, 3D Augmented Reality Painting Book for Vocabulary Learning iCreate). Language visualization (WordSift) is also used. Visual context tools include many other types of tools as well. These are categorized below.

Flashcards

Flashcards are usually two-sided cards with short information (note). On one side, they have the prompt or question and information about it or answer on the other. However, it is not very unusual to encounter cards with one side in the virtual environment. The information can be textual or visual. Examples provided feature visual components since we want to focus on the visual context in this chapter.

Premade flashcards are the best option for those who want to save time and are comfortable encountering familiar words. Some applications resolve this by assessing which words the user already knows. Such flash cards are Best Vocabulary Flashcard, the prime example of flashcards with visual clues. Next are MES Online Flash Cards, WordUp, and Drops.

WordUp provides pictures for better understanding and cuts from videos, quotes and parts of news articles. Dops and WordUp are not providing flashcards-like exercises only, but visual learning through flashcards with pictures is the core of their vocabulary learning process.

Colouring pages

Colouring pages are another tool that can make learning more fun. Some of them (not all) provide a picture of colours and the names of colours which might be helpful when introducing and learning colours. Examples include Room Recess colouring pages naming three primary colours (red, green, blue) to let users mix their colours and Coloring Book Pages For Adults naming more colours.

Colouring pages with colours only or hybrid with some text open great space for the creativity of learners or teachers. Colouring pages do not have to assist with learning colours but with other themes. For such purposes, pages like Super Coloring, which provides, for example, anatomy colouring pages, can be used. A teacher might instruct learners to select one from the anatomy colouring page, and while learners are colouring, he can ask some of them, "What are you colouring?" to drill target vocabulary or make them ask this question to their classmates. The same can be done without the assistance of a teacher when two or more learners are learning together. One may argue that the same can be done on paper. However, it is more eco-friendly and allows everyone to choose from many options when done digitally. When used by the learner alone, it can help him acquire

vocabulary while browsing colouring pages. Colouring might be less stressful for some learners since they are not willing to draw because they dislike drawing as they think they cannot draw well and are embarrassed to draw.

Labelling pictures

Such activities instruct students to match words or more words with the corresponding picture. Great examples are English Vocabulary by Pictures, Matching exercises in Quizlet and British Council matching exercises.

Picture dictionaries

Available picture dictionaries include Knowji, MEMRiSE English Visual Dictionary, Online Picture Dictionary, and Best Picture Dictionary.

Semantic contexts

Computerized tools and activities developing vocabulary in semantic context were designed to learn foreign vocabulary through other words.

Monolingual dictionaries and activities

Such dictionaries and activities provide explanations, definitions and examples through other words in one target language to help learners internalize vocabulary. Compared to a paper dictionary, a digital dictionary has several advantages, including audio, portability and flexibility, and quicker search. Knoword, vocab1, Magoosh, VocabularyBuilder, lexipedia, wordhippo, YourDictionary, Vocabulary Spelling City, Merriam-Webster and WORDCRAFT are some available electronic monolingual dictionaries and activities.

Pokrivčáková (2014, p. 26) points out that "Even more effective can be interactive activities based on relating words into pairs or groups according to their meaning relationships, e.g. similarity, opposition, similar sounding, similar spelling, etc.".

Synonymous, antonymous, homonymous and homophonic dictionaries and activities

Synonymous dictionaries and activities include SNONYMS, Matching Synonyms Game, Synonyms Game, MyEnglishPages, and English Maven. Antonymic dictionaries and activities Ant-O-Nyms - Online Game, Antonym Game for Kids, and Opposites – Adjectives English Vocabulary Game provide activities with antonyms. Thesaurus is a dictionary where antonyms can be found. Homonymous and homophonic dictionaries and activities Activities with homonyms and homophones are provided by EnglishCLUB, UsingEnglish, TurtleDiary, Mr.Nussbaum. and Wordwall.

Interlingual context

The mother tongue of students helps with learning and drilling vocabulary through dictionaries and activities with interlingual context.

Bilingual dictionaries and activities

Bilingual dictionaries and activities include, for example, slovník.sk, MyVocab, and webSlovník.

On-line translators and translating activities

Translators include Google Translate, Lexika, and Lingea.

Duolingo

"Duolingo is a game-style language learning tool that's based online" (Edwards, 2022). Duolingo was mentioned several times by participants in the study when asked what digital vocabulary learning tools they use. What makes it more popular compared to other similar applications may lie in what makes it different, and that is its gamified structure. "Lessons are presented in the format of mobile video games so that learners are kept engaged and competitive" (GoHow, 2021) through public leader boards, reward systems, and challenges. In the learning process in Duolingo, a learner's mother tongue is used to help with learning.

Overview of existing research

The study by G. M. S Mohammed and J. K. M. Ali (2021) investigated attitudes towards informal digital learning of English vocabulary (IDLEV) of Saudi EFL learners outside the academic environment. The study aimed to answer the following questions: "What are the students' attitudes toward IDLE to learn vocabulary? Which IDLEV practices are used by Saudi EFL learners in acquiring English vocabulary? To which degree are the IDLEV students' attitudes and practices correlated? Are the IDLEV students' attitudes towards and practices of IDLEV correlated with their GPA and study levels?" (Mohammed & Ali, 2021, p. 346). The results showed that the study subjects have positive attitudes towards the IDLE and find it useful for English vocabulary improvement.

The study showed that the most popular IDLEV tools include watching videos, listening to English, reading English on the internet or social media and looking up new words in e-dictionaries.

Furthermore, the research also found that the mean of learners' attitudes towards IDLEV is higher than their practices (Mohammed & Ali, 2021). It was found that there is a weak positive relationship between the attitudes towards the IDLEV and the learners' GPA. It was also determined that the relationship between the learners' practices in the IDLEV and their performance is strongly positive.

The study *Second Language Learners' Attitudes towards the Methods of Learning Vocabulary* (Ali, Mukundan, Baki & Ayub, 2012) This study aimed to investigate the learner's attitude towards methods of learning English vocabulary. The researcher used three methods: contextual Clues, dictionary Strategy and CAVL. The results showed that compared to other methods, the attitude of students using CAVL to learn English vocabulary was more positive. The research also suggests that it is due to the tools matching students' aptitude for learning. The study also proved that how students approach the methods plays a significant role in how useful and limited the methods of learning English vocabulary are.

The research by Maleki, Ghasemi & Moharami (2015) questioned whether computer-assisted vocabulary learning (CAVL) application called Mandegar could develop learners' attitudes toward learning academic English vocabulary. The

software was based on flashcards and used spaced repetition method. Two classes were randomly chosen as the experimental group, and two were selected as the control group. The experimental group used the software to learn English vocabulary and the control group learned it traditionally. That means the use of synonyms, examples and drilling vocabulary. The survey used for answering the questions revealed that students had developed a positive attitude toward using technology in learning English vocabulary. The findings also suggested that learners` negative perceptions of vocabulary learning might improve by adopting new strategies, such as technology integration into learning and teaching.

RESEARCH

Research objective

The main objective of the research is to evaluate the attitudes of foreign learners towards the use of digital tools in the development of their own English vocabulary. The secondary objective is to assess their perspective on vocabulary learning. The last objective is to identify digital tools for vocabulary development in learning English as a foreign language favoured by students.

Research questions

Students use different technologies in their daily lives. The progress of ICT enriched not only the personal sphere of its users but also the educational sphere. In this paper, the researcher would like to investigate and evaluate the use of digital tools in studying the English language. The area the researcher focuses on is the attitude of students to the use of digital tools in the development of their own English vocabulary. For this purpose, the researcher formulated the following questions:

Question 1: What is the attitude of students towards the use of digital tools in the development of their own English vocabulary?

Question 2: What factors influence the attitude towards learning vocabulary with digital tools?

Question 3: What digital tools for vocabulary development in learning English as a foreign language are popular among students?

Research method

This study used a questionnaire to examine students' attitudes to learning English vocabulary through digital tools. The researcher has chosen this quantitative method because she finds it very efficient in many ways. Questionnaires often allow researchers to collect large amounts of data from sizeable groups of respondents in a relatively short amount of time. (Lambert, 2019). Bell (1999) claims that properly conducting the questionnaire may be a great way of gathering a huge amount of information. Values, experiences, and prior behaviour of people can be observed through such a method and supports the researcher's choice since she aims to obtain such data. Lambert (2019) also

acknowledges that questionnaires can be particularly useful when the research aims to capture a surface impression of the extent to which groups of people agree or disagree on an issue or establish the range of thoughts and views concerning certain topics.

The researcher developed the questionnaire with different sets of questions. The question at the beginning of the questionnaire about English being a mother tongue or second language is included to verify that a respondent is from the target group, a non-native English speaker. Questions number 1 and 2 focus on gaining demographic information about the participants. Multiple choice questions 2 and 3 focus on information about the test subjects and their English language proficiency. To investigate the interrelationships between screen time, English vocabulary learning, and English vocabulary learning with digital tools, multiple-choice questions 5-7 were designed. Question 8 examines the approach of students to English vocabulary learning.

It consists of 4 closed-ended items. The test subjects choose answers from a 5-point Likert Scale since it is a method that was used and validated by many scientists (Ankur, 2015).

They were given these options to answer: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), and Strongly Disagree (SD). Question 9 examines the approach of students to digital tools and learning English vocabulary with them. It consists of 13 closed-ended items and uses the same scale for answers as the previous question. Open-ended item 10 follows the latest trends in the use of digital tools for learning English vocabulary. The researcher chose this type of question because she did not want to influence the respondents' answers. The respondents were given space for a short answer. The last open-ended item was included to let the test subject submit their comments and views.

The order of the questions was designed so that the questions proceeded from less sensitive to more sensitive, simpler to more complex. This approach was chosen because, from the researcher's experience, simpler and less sensitive introductory questions are more likely to gain the respondent's attention and willingness to participate in the questionnaire. The questions were also arranged in such a way that those relating to a specific topic or sub-topic were grouped or followed because the researcher believes that it is more energy-efficient. Answering grouped questions on the same topic or subtopic takes less energy, time, and concentration than switching between questions on different topics, thus supporting respondents' interest in continuing the questionnaire.

For similar reasons, the researcher formulated the questions in such a way as to be as simple and comprehensible as possible.

Different questions examine different research questions and hypotheses. Tables have been created to make it easier to follow. Table one shows which item or item of the questionnaire was created to answer a specific research question. To answer research question number 1, questionnaire item number 9 was created.

To answer question 2, items 1, 2, 3, 4, 5, 6, 7, 8, and 9 are required. To study research question 3, item 10 was created.

Research question	Questionnaire item(s) to answer the question
1. What is the attitude of students towards the use of digital tools in the development of their own English vocabulary?	9.3, 9.4, 9.6, 9.8, 9.9, 9.10, 9.11, 9.12, 9.13
2. What factors influence the attitude towards learning vocabulary with digital tools?	1, 2, 3, 4, 5, 6, 7, 8, 9
3. What digital tools for vocabulary development in learning English as a foreign language are popular among students?	10

Table 1. Questionnaire items to answer research questions

Most questionnaire items were formed by the researcher herself, however, a significant part of the items was inspired by or adapted from Maleki, Ghasemi, and Moharami (2015) and one from Ali (2012). Table 2 was created to illustrate this matter. The questions created by the researcher are based on her personal experience in learning and teaching English vocabulary.

Researcher(s)	Research topics	Items
Maleki, Ghasemi & Moharami (2015)	CAVL: Does it develop learner's attitude?	8.1, 8.2, 8.3, 9.1, 9.2, 9.4, 9.5, 9.9
Ali (2012)	Second Language Learners' Attitudes towards the Methods of Learning Vocabulary	9.13
Researcher herself	Digital tools for vocabulary development in learning English as a foreign language	1, 2, 3, 4, 5, 6, 7, 8.4, 9.3, 9.6, 9.7, 9.8, 9.10, 9.11, 9.12, 10

Table 2. Adapted and created items by the researcher

Respondents

This study was conducted with 96 non-native English language learners, most of whom were from the Slovak Republic (77) and the rest of the respondents from

other countries (19) including Germany (4), Australia (2), China (2), Italy (2), Netherlands (2), Bosnia and Herzegovina (1), Czech Republic (1), Philippines (1), Spain (1), Slovenia (1), Taiwan (1), and the United States (1).

The respondents ranged from 13 to 75 years of age. Most respondents were in the age range of 19-24 (58). Other respondents were 25-35 (26), 36-44 (4), 16-18 (4), 45-60 (2), 13-15 (1), and 67-75 (1) years of age.

The majority of respondents have been learning the English language for 10 and more years (60). Other respondents have been learning the English language for 5-10 years (24), 2-5 years (7), 1-2 years (3), and less than 1 year (2).

Many respondents identified themselves as intermediate (46) or advanced (42) English language speakers. The rest of respondents identified themselves as beginners (8).

Data analysis

The data collected by the researcher through questionnaire items were analysed by using statistical devices such as a five-point Likert scale evaluation, standard deviation (SD) to assess variability in answers given, and standard error (SE) "to estimate the efficiency, accuracy, and consistency of a sample "(Corporate Finance Institute, 2022). Criteria for the rating scale interpretation are shown in Table 3.

Ranges of the mean scores	**Levels of Agreement**
1.00-1.80	Strongly disagree
1.81-2.60	Disagree
2.61-3.40	Undecided
3.41-4.20	Agree
4.21-5.00	Strongly agree

Table 3. Criteria for the rating scale interpretation

Question 1: What is the attitude of students towards the use of digital tools in the development of their own English vocabulary?

The results are presented in Table 5 by mean scores (MS), level of agreement (LA) associated with them, and standard deviation (SD) which shows on what scale the opinions of test subjects varied.

Table 4 below shows the attitudes of students toward learning English vocabulary with digital tools. Items obtained mean from 3.66 to 4.40. The average mean is 3.90. According to the criteria for the rating scale interpretation, the overall result is Agree which indicates that the attitude of participants towards CAVL is positive.

Standard deviation (SD) ranges from 0.81 to 1.15 average SD is 1.02. Based on the source that defines acceptable SD as "no greater than plus or minus 2"

(LabCE.com, [Undated]), this demonstrates the hat variability of opinions between research participants is low.

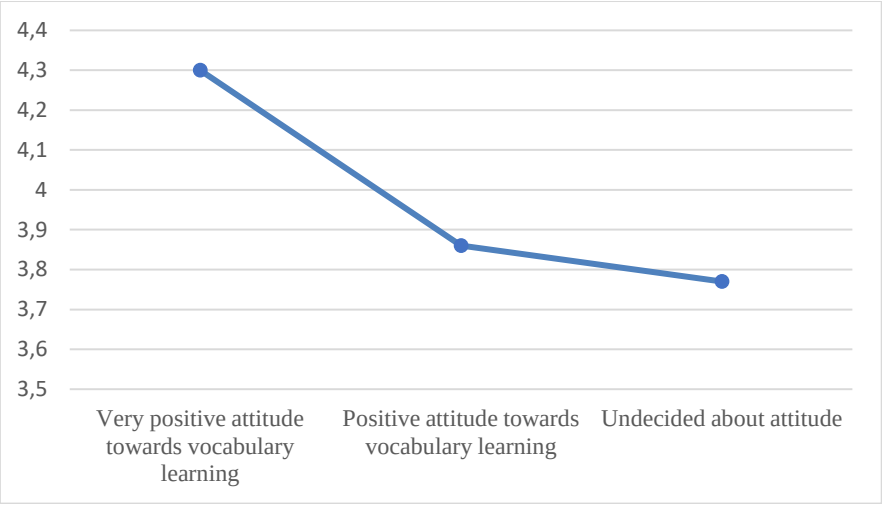
The standard error (SE) ranges from 0.08 to 0.12. Since it is a value below 0.8 to 0.9 it is "seen by providers and regulators alike as an adequate demonstration of acceptable reliability for any assessment" (LabCE.com, [Undated]).

Nos.	Items	SD	SE	MS	LA
9.3	I find most of the digital tools easy to use.	0.81	0.08	4.40	Strongly agree
9.4	I often use digital resources to improve my English vocabulary.	1.05	0.11	4.05	Agree
9.6	It takes less time to learn vocabulary with digital tools.	1.11	0.12	3.72	Agree
9.8	I prefer digital tools for learning English vocabulary over non-digital ones.	1.15	0.12	3.66	Agree
9.9	I think digital tools can help me improve my English vocabulary.	0.84	0.09	4.11	Agree
9.10	Learning vocabulary via digital tools is more interesting and useful than without them.	0.98	0.10	3.90	Agree
9.11	I prefer writing, reading, and learning vocabulary through digital tools to writing, reading and learning without them.	1.09	0.11	3.67	Agree
9.12	I use various digital means to study vocabulary.	1.04	0.11	3.75	Agree
9.13	I think that digital tools are suitable for my kind of vocabulary learning.	1.04	0.11	3.80	Agree
	Average	1.02	0.11	3.90	Agree

Table 4. Attitudes of students towards learning English vocabulary with digital tools

Question 2: What factors influence the attitude towards learning vocabulary with digital tools?

The results suggest that there might be a correlation between attitude towards English vocabulary learning and towards English vocabulary learning with ICT. The group of participants who has a very positive attitude towards vocabulary learning displayed the highest mean for attitude towards learning English vocabulary with digital tools (4.30). The group with positive attitude displayed lower mean than the previous one (3.86) but a higher mean than the group of undecided participants (3.77). Even though there were not enough samples for the next two groups (negative attitude- 4, very negative attitude- 4), it is evident that the more positive attitude towards English vocabulary learning, the more positive attitude towards learning it with digital tools the students have.



Graph 1: Relationship between attitude towards English vocabulary learning and towards English vocabulary learning with digital tools.

Question 3: What digital tools for vocabulary development in learning English as a foreign language are popular among students?

Table 5 shows students´ replies to questionnaire item 10 and how many students noted the same mean of digital English vocabulary learning. The three most often mentioned tools were a smartphone, dictionary and application Duolingo.

Tool	**Number of respondents**	**Tool**	**Number of respondents**
Smartphone	20	English teaching Youtube channels	2
Digital dictionary	14	Flashcards (ANKI)	2
Duolingo	14	Podcasts	2
Computer	11	Quizlet	2
Translators	10	WordUp	2
Notebook	9	Babbel	1
Films	8	Busuu	1
Games	8	Cambridge English	1
Internet	8	Comix	1

Computerized tests, exercises, and quizzes	7	English with Lucy	1
YouTube	7	Google	1
Online articles	4	Kahoot	1
TV	4	Memrise	1
Videos	4	Social media	1
Vocabulary applications	4	Songs	1
Online conversations	3	Writing thesis in the English language	1
Drops	2	Crosswords	1
E-books	2	Cambridge English	1

Table 5. Digital tools used by students to learn vocabulary

Research conclusion

The research aimed to investigate the attitude of students towards learning English vocabulary, factors that influence it and popular tool choices for English vocabulary learning reinforced by digital tools. In conclusion, it appears that the students have a positive attitude towards the use of digital tools in the development of their own English vocabulary. As for factors that influence the attitude towards learning vocabulary with digital tools, the research suggests that there is a relationship between attitude towards English vocabulary learning and towards English vocabulary learning with digital tools. The more positive attitude towards English vocabulary learning, the more positive attitude towards learning it with digital tools the students have. Digital tools popular among students for vocabulary development in learning English as a foreign language are smartphones, dictionaries, and the application Duolingo.

Discussion

A similar conclusion regarding attitudes of learners towards learning English vocabulary reinforced by digital tools was drawn from multiple studies including "Informal Digital Learning of English Vocabulary: Saudi EFL Learners' Attitudes and Practices" by G. M. S Mohammed and J. K. M. Ali, "Second Language Learners' Attitudes towards the Methods of Learning Vocabulary" by Ali, Mukundan, Baki, Ayub, "CAVL: Does it develop learner's attitude?" by Maleki, Ghasemi & Moharami (2015). All these studies proved the same fact as this study and that is that students have a positive attitude towards learning English language vocabulary with digital tools. When comparing results of this study regarding popular vocabulary tool choices to an older study conducted by Mohammed and Ali (2021), it must be pointed out that the results were not identical. Their study showed that the most

popular tools include watching videos, listening to English, reading English on the internet or on social media and looking up new words in e-dictionaries while our study reported smartphones, digital dictionaries, the application Duolingo, a computer, translators, a laptop, films, games, the internet, and computerized tests, exercises, and quizzes. Smartphones, Duolingo, computer, translators, a laptop, games, and computerized tests, exercises, and quizzes were not found to be popular in their study because the researchers did not include such options in their survey and did not let students add other options which are not included in the questionnaire already.

Study limitations

The study's main limitation is the lack of diversity in the background of study subjects, which led to an inability to investigate several factors that may influence the attitude towards learning vocabulary with ICT. The research is also limited because only those who use electronic devices, follow social media, or browse the internet could participate in the study. If people who do not use electronic devices at all or not as often participated, the results might be slightly different. Including such people was not possible due to the lack of time, which is another limitation of the study.

Suggestions for further research

Because of limitations, future investigations are necessary to validate the conclusions drawn from this research. The researcher suggests close monitoring of respondents' backgrounds and conscious gain of respondents with backgrounds and opinions from which samples are needed for the study to successfully investigate all research questions and hypotheses. Similar kinds of studies may also benefit from gaining data via online surveys and paper surveys to recruit respondents who do not use the internet often.

Suggestions for pedagogical practice

English language learners have a positive attitude towards technology in learning vocabulary; therefore, it may prove beneficial to include it in the teaching process but also introduce it for their own vocabulary learning. The results from the survey may serve as a guideline as to which tools to include in the beginning since it might be helpful to start with something that students feel positively about already and then move to less known and used tools.

A teacher may also do his own research about known favourite tools of his students and their approach. The better the teacher knows his students, the easier it is to create interesting and engaging lessons. This paper includes the questionnaire used for this study that can be used for that purpose, or the teacher can use it for inspiration to create his own questionnaire.

Gamification in teaching and learning English as a foreign language

Tomáš Meliš

Introduction

The growth of the game industry in recent years has been impactful and influential for modern education. Ideas from the past still dominate the present day's teaching of foreign languages. However, as the recognition and necessity of foreign languages become increasingly requested, the learner is put into a position when a decision must be made.

Surrounded by many opportunities to acquire knowledge about the language, the learners decide to use the one source close to them, the games. Over the years, scholars identified many factors beneficial for the learners, changing the traditional premise about language education (Hitková & Hitka, 2022, Hriňák, 2018). Nowadays, the field is known as gamification. Its rapid development was not overlooked, and as a result, it became the topic of our paper, considering its future application in our own working place as future teachers.

The presented paper aims to identify the opinions, attitudes and preferences of English foreign language learners towards specific aspects of computer games and language applications. Subsequently, determine the student's attitude towards gamification in TEFL (teaching English as a foreign language) and compare the attitudes of Slovak and International foreign English learners.

The beginning of the paper is devoted to the theoretical background summarized in three chapters, introducing the general topics presented in the following part. The first section deals with games and gamification, their definitions, characteristics, historical backgrounds, and theories. The second section focuses on factors applicable to language education and possible problems affecting the learners. The final section of the theoretical part examines the most influential, unavoidable area of the pupils, learners' attitudes.

At the paper's core, the research's individual elements are described. Beginning with a general overview of the study, followed by main objectives, research questions, profiles of participants, and research methodology. The essential part is analysing collected data, their distribution into specific areas and interpretation. The last part presents the results, limitations and future research recommendations.

Games and gamification

Human life is like a game. Sometimes successful and happy; suddenly, it is the complete opposite. Looking back at our childhood, we will see good and bad memories, usually connected with an activity that made us happy. With a closer look, we will see games as a part of our life. As we grow up and educate, the games are doing the same process. They are developing from the basic to more complicated, focusing on a wide range, covering up at least a part of our real life. One field showed the most promising potential to shelter up the fragment. It became known as gamification.

Definition of game and its characteristics

It might be more challenging to explain what a game is in present-day society than one would think it would be. The term "game" can be defined in many different ways, depending on several characteristics of the game, such as format, environment, goals, or even methods used by the user during playing. Juul (2003), in his work The Game, the Player, the World: Looking for a Heart of Gameness, identified seven definitions indicating divergent viewpoints towards the same aspects of games expressed in numerous ways.

For the paper, it is necessary to mention some of them. Huizinga (1949) understood a game as a free activity placed outside daily human life with the attitude of not being serious within the boundaries of time and space. Caillois (1961) sees it as an activity essentially voluntary, detached in time and space, unproductive but overseen by rules. Suits (1967) perceives the game as engaging with results, where rules limit the potential. Nevertheless, they are accepted. Salen and Zimmerman (2003, p. 96) describe a game as "a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome".

As we look closer at the presented definitions, we can assume that they have a homogeneous central point used to transform an activity into a game. They are called characteristics of games and are perceived as further contributions to their understanding. Schell (2008) and Charsky (2010) recognized similar aspects, such as goals (mainly oriented on winning to improve performance), rules (framework of limitation within the boundaries of player's actions), choices/options (decisions made by a player in the game), and challenges (tasks and activities the player need to do to reach the goal). Additionally, Charsky (2010) highlights the importance of competition as it can encourage a player to change his/her attitude to previously mentioned aspects.

On the other hand, Whitton (2010) suggests an entirely different method. She categorizes characteristics like exploration, fantasy, interaction, outcome, people, and safety. Their connections can be found:

- within the context of the environment, not only in the game but also in the decisions of the person,

- in the actions done by the person influencing the future state of play and generation of feedback,
- in consequences reflected in the real world.
- Indeed, the definitions of the game and its characteristics may vary depending on the researcher's approach. Regardless of their choice, the core will stay the same.

Types of players in games

Archetypes of video game players represent various ways to understand the audience of platforms used in gamification. Not all people enjoy the presented engagement due to their expectations and, most likely, the result and satisfaction. By recognizing and addressing what types of games and previously mentioned game elements are catching a person's attention, it is possible to identify the particular ways the gamification might affect them. Furthermore, the results can show the future application in education (discussed later on) and works associated with learning.

Richard Bartle created the most famous and widely accepted categorization of players. In 1996, he released his research focusing on Multi-user Adventure players, where he characterized his subjects based on the results into four groups of players. It consisted of Socializer, Killer, Achiever, and Explorer separated in a grid with four-quadrant and two axes. One represented action vs interaction, while the other one embodied players vs the world (Christians, 2018). Stieglitz et al. (2017) describe Bartle's categorization as follows:

- Killers are users who enjoy challenging others to win against them. They aim to triumph, climb the leaderboards, and be better than anybody else. The core of their interest is in the competitive element. Games like Call of Duty or Fortnite attracts them the most due to their systems to earn points for kills. Such players are hard to gamify because their preferences and habits frighten other players (Christians, 2018).

- Achievers are similar to Killers in the form of interests toward the competitive element. However, their interaction is not focused on other players but on the world itself. Points, levels, and achievements are considered a symbol/goal for them. Genres of a game like Multiplayer Online Battle Arena (MOBA), Massively Multiplayer Online Role-Playing Game (MMORPG) and games like World of Warcraft and League of Legends are attracting them the most. Achiever is concentrating on the reward and outcome. They do not mind doing long, tedious tasks as their failure will cause a loss of interest (Christians, 2018).

- Explorer embodies a user who aims at self-discovery inside the application, additionally self-learning its boundaries and using them for their purposes. They prefer mainly detailed games where exploration, experimenting or uncovering mysteries and secrets are their main activities. Yet, the actions are not limited only to them. Simulation and Role-Playing games (RPG) are also interactions that can be a motivating source due to the opportunity to create and simulate the

environment while experimenting with their desired sources. The satisfaction might in games like Minecraft or SimCity be spotted. Compared with the Killer or the Achiever, the leaderboard is not exciting since their actions are more engaging and entertaining when focused on the logical sphere (Christians, 2018).

- Socializers use programs as a link, a connecting bridge to communicate with other people. Cooperation, communication, or simply spending time with individuals is one of the goals. Completing quests and encountering enemies in dungeons requires teamwork, coordinated actions, and communication. A typical example of all aspects is a Massively Multiplayer Online Role-Playing Game (MMORPG). Similarly to the explorers, leaderboard or competitiveness is not always very fascinating. Regardless of the previously mentioned elements, it is appropriate to state that some users are exceptions since communication with others is still present (Christians, 2018).

The historical markers of gamification

The origin is not always as clear as we would like it to be. According to Kim et al. (2018), it might be very challenging to trace the origin of gamification since the starting point of the entire timeline may be placed in a wide range of variations. Thus, history is very complicated and not as vibrant as any other; few signs or rather breaking points marked the advance.

The first major one was related to American business. Christians (2018) claim that S&H (Sperry and Hutchinson) introduced the so-called loyalty reward system in 1896. A process of purchasing goods via money and earning Green Stamps. The system is still present in many games today, specifically mobile games and applications, via daily logging and rewarding "free" prizes.

The second one was associated with the feedback provided in the sports domain. In 1973, Charles Coonradt published a work called The Game of Work, where he analyzed a phenomenon when co-workers who are supposed to work together in a workplace have issues achieving teamwork while sports players are perfectly coordinated, with a small amount of inconsistency. He realized the problem lies in the difference in feedback. On the one hand, there was obvious, clear feedback. On the other hand, inconsistency and vagueness occurred. His suggestion was to implement a feedback loop in the workplace (Christians, 2018). Nowadays, the system is called a scoreboard used in games to present the player's current performance, motivating them to improve further.

The last one was associated with an academic standpoint. According to Kim et al. (2018), the effort to use gamification in education was by Thomas W. Malone made in the 1980s.

He wrote several academic works focusing on the possible use of video games, where he realized how can elements of a game be used in different areas of education. The interest was also placed on the people's motivation, describing three theories under the sectors: challenge, fantasy, and curiosity (Malone, 1981).

The field of education will be discussed in the next chapter concentrating on gamification in language education.

Definition of gamification

Defining a field can be challenging, especially one with a bright future. The definition of gamification may vary due to the approaches presented in the different works.

It is necessary to mention two relatively accepted descriptions. According to Deterding et al. (2011, p. 9), gamification is defined as "the use of game design elements in non-game context". The definition is brief or incomplete since it provides only a simple and basic outline, missing outcomes and goals (Stieglitz et al., 2017). Nevertheless, Huotari and Hamari (2012, p. 25) came up with a more precise one as they see it as "a process of enhancing a service with affordances for gameful experiences to support user's overall value creation". Their explanation seems to be more detailed. It indicates not only the use but also the experience and outcomes. It focuses more on the value creation of the particular person/user (Stieglitz et al., 2017).

As was mentioned above, the characterization may differ from work to work. Therefore, the different authors further demonstrate an interest in employee engagement in tasks, promotion via collaboration, or motivation improvements (Reeves & Read, 2009; McGonigal, 2011; Zichermann & Linder, 2013; in Kim et al., 2018).

The importance of the fundamental parts lies in the comprehension of the meaning. Kim et al. (2018) refer to three central points to avoid misunderstanding. The initial point clarifies the structure of gamification as a set of activities and systematic processes, denying it as a single activity. The subsequent specifies the purpose, fixing it to solve specific problems. The last indicates that the "real" foundation of gamification should be in the characteristics of game elements rather than in the pure use of game mechanisms (Kim et al., 2018).

Gamification theories

The idea of gamification is based on divergent concepts and theories. As was highlighted previously, gamification can be linked to business or social science and education. The section will briefly mention three theories that influenced its concept. The first philosophy is motivation theory. At the centre of the idea is motivation. It refers to the mental or emotional state of an individual's changes in behaviour or psychology (Kim et al., 2018). According to Maslow (1943), the theory's starting point is psychological needs.

The second philosophy is achievement goal theory. It proposes people's desire to succeed, fueled by the vision of accomplishing a specific goal. It consists of two types of goals: mastery goal and performance goal (Kim et al., 2018), usually addressed as task-involved goals and ego-involved goals (Eccles and Wigfield, 2002). Siefert's research from 2004 proves that the desire for a mastery goal (task-

involved goals) acquires abilities to create a task or understand a concept. On the other hand, the desire for a performance goal (ego-involved goals) is to display higher achievements, showing the contrast with other people in social comparison with its outcomes.

The third philosophy is known as flow theory. Its roots are in positive psychology. The author, Csikszentmihalyi, focused his research on happiness by treating it as a state of being that is personal and positive (Kim et al., 2018). He described happiness within the background of a task accomplishment as a feeling of not being bored or anxious. It can be viewed as a theory of optimal experience when people enjoy "some experience" so much that they will do anything for it, even at a great cost (Csikszentmihalyi, 2008).

Csikszentmihalyi (2008) identifies four characteristics of flow related to gamification:

- Activities that are challenging and require skills.
- Action and awareness merging together.
- At-hand concentration on the task.
- Clarity in goals and feedback.

As was shown, different researchers and theories have different approaches. The concepts have influenced the area of gamification from all directions bringing something new and adapting it to the given context. Some of them will be addressed later in a more specific field: education. Therefore, it was necessary to mention the ones related to it.

If we want to understand gamification as a newly developed area, history will show us its roots. For the paper, three historical markers were mentioned, influencing gamification before its "birth" in 2002, followed by clear definitions of the terms gamification and games. Like many other fields, also gamification has its own theories.

Since the number of gamification theories is countable, only some were highlighted. They introduce the core idea of each. A significant role in the theme of gamification plays the issue of player types mentioned before. Each segment has its own value and a place in the work.

Gamification in language education

Gamification can potentially improve the learning process not only for the learner but also for the teacher who is responsible for it. In recent years, as the development of digital technologies started to improve and influence all areas of human life, their application in the educative sphere has begun to be recognized. Games over the years were only a form of entertainment considered. Eventually, they caught the scholars' eyes as they showed progressive development (Osma-Ruiz et al., 2015). Using gamification in teaching and learning pointed out factors we consider important to mention as they are related to the results presented in the further part of the paper.

Language game design elements and feedback

Game design is the starting point for successfully implementing game elements into education. The design of games is very complex and problematic, considering the area in which they should be applied. Education is even more difficult due to various factors affecting it from all angles. Nah et al. (2014) identified eight-game design elements specific for education purposes:

1. Points - functioning as a measurement of success or achievement for the person. Across various games, they have different forms and types (e.g., Experience Points (XP) or Steam Points).
2. Levels - also known as stages, described as a progression system allowing the person to put some effort and develop skills to obtain a reward for completing a task.
3. Badges - marks of appreciation or task accomplishments, helping the learner to be more engaged and maintain their interest. They can also partially influence learners' attitudes towards the learning process.
4. Leaderboards - used to create a competitive environment for learners to improve interest and engagement.
5. Rewards - an effective way how to increase students' inspiration. The most important is the timing and scale of the reward since it may affect learner interest. Character upgrades are an efficient way to show the learners their progress and the effort they have spent to reach them.
6. Progress bars – unlike badges, they track and display the total goal development.
7. Storyline – refers to the actual story of the game. A successful storyline helps learners achieve the ideal curve and stay engaged throughout the learning process. The most interesting stories are usually based on concepts of real life.
8. Feedback – a short report related to learners' performance, helping him/her to improve, adapt, and grow in the particular task. The most important parts of the feedback are frequency, intensity, immediacy, and the form in which the feedback is given to the learner. Also, it needs to be clear and related to the current performance, or else its value is significantly lowered.

According to Šćepanović and Žarić (2015), the most occurring problems for the teachers or instructors in the classrooms are students' interest and concentration during the lesson. The answer to the problems can be located in methods, more precisely in the application of the game elements mentioned above, in the courses. They carried out an overview of different studies applying the game elements in classes, where the most catching feature identified across the studies was the feedback.

The essential part of a learners' improvement of the information about their actions after a particular task is provided by feedback. It is described as post-response information given to a learner to inform them about the state or performance. It plays a crucial role in the learning process as it is aimed to:

- connect response with the prior stimuli,
- inform the learner, who can confirm or adjust the previous response,
- help the learner construct internal schemata or analyze their learning processes,
- encourage the learner to provide more feedback to others (increasing response rate and accuracy).

Generally, the most significant aspect of the feedback is its quality in terms of accuracy. However, there are others. Also, the source giving the feedback is important (e.g., peers, teachers, artificial intelligence) and the form in which the source gives it (e.g., written, spoken/oral) (Gielen et al., 2010).

Language game design elements are and will be the core problem in education. The responsibility placed upon the design is determining the success of a method applied in the class and whether the action/game can or cannot be considered a part of gamification. As was pointed out, the most crucial element shown in various studies is feedback. It is a source of great value for the learner and the teacher, contributing to current or future development in the learning process. Its place in the learning process has a meaning, and without it would not be as effective as one would think.

Gamification in foreign language learning

Foreign language teachers' increasing belief in using video games during learning is higher than teachers of other subjects. Playing games during foreign language classes has been a long tradition for years for professionals. Yet, the development of digital technologies in the past few years opened a way for teachers to implement video games as "a common tool" in foreign language learning (Osma-Ruiz et al., 2015).

Teaching/learning English as a foreign language is adjusted around four communicative language skills. Much time spent teaching/learning English is focused on communicative language skills (listening, speaking, reading, writing). Osma-Ruiz et al. (2015) indicated the most challenging speaking skills are due to the technical complications linked to the development of the tasks, especially the pronunciation. Hence, it should aim at understandability and intelligibility, not nativeness or accentedness (Pokrivčáková, 2013).

Nevertheless, the view is influenced by the platform choice since not all platforms provide the same opportunities. Arce and Valdivia (2020) say the effectiveness of teaching/learning English as a foreign language and language skills depends on the platform/device, which can offer the activities/tasks the learner is interested in learning. For instance, "Duolingo" as a multiplatform program, can implement tasks related to grammar and pronunciation. In fact, as a result, it may increase learners' interest and engagement in future actions (Arce and Valdivia, 2020).

We also want to mention one work from Slovakia that discusses the Potential of Computer Games in developing English Vocabulary. It deals with English vocabulary, specifically in a massively multiplayer online role-playing environment and shows the potential to develop all four communicative language skills.

To make the learning process effective, learners need to set goals to accomplish their visions. Hence, the goal can be described as "the cognitive embodiment of a desired future state that individuals are committed to attaining, which subsequently guides their behavior" (Lee & Bong, 2019, p. 2). It is known that learners pursue multiple goals at once. As a result, in the language learning environment, the learner can come to the point when their goals in a foreign language conflict with their abilities, knowledge, and level of proficiency in the language, which will disrupt their familiarity with the foreign language (Lee & Bong, 2019). In gamification, the goal is viewed as an achievement represented in the game as a reward. In a well-developed environment, the idea of success (reaching the goal) /achievement is further supplied with players' engagement, resulting in a position essentially based on the choice preferred by the person (Niman, 2014). According to self-determination theory (the person is determined to achieve growth in a psychological sphere) and mindset theory, a theory of intelligence (fixing mindset to pursue different types of goals), it is possible to state that setting a goal in language learning provides opportunities for the learner to learn and advance their competences in the learning process (Lee & Bong, 2019).

As mentioned several times before, the environment is a considerable part of the influence on the learner during the learning process. It is necessary to clarify the term as its meaning is different concerning gamification.

In the paper, the term environment can be interpreted in two ways. The first one is related to the game elements mentioned before. Environment as an in-game feature represents a setting in which it operates (e.g., the visual representation of the application and structure of the interface) (Lavoué et al., 2019). The second meaning of the term is associated with requirements necessary for the teacher or learner to create a space appropriate for learning (e.g., a safe, engaging place for cooperation between peers) (Kozárová and Gunišová, 2019; in Duchovičová et al., 2019).

Problems of gamification in foreign language learning

Many gamification studies in education have focused on exploring positive outcomes for the learner, yet the negative ones are still unnoticed. Implementing the best game elements does not always guarantee the desired outcomes. Since the issue needs to be addressed, a list of potential problems was formed. Issues such as declining effect, cheating, privacy, task quality, exploitation, manipulation, lack of attention, learners' genres and player profiles were identified (Thiebes et al., 2014; Kim & Werbach, 2016; Andrade et al., 2016; in Toda et al., 2018). Authors of the work The Dark Side of Gamification: An Overview of Negative Effects of

Gamification in Education looked closely at the problem on an international scale and identified four negative effects: indifference, loss of performance, undesired behaviour and declining effects closely linked to the game elements such as leaderboards, badges, and points (Toda et al., 2018). Despite the problems, gamification in education is very promising, as shown above. Thus, their ignorance might create an impact on the learner.

The experience of failure in a real-life is different from the one in games. People try to avoid failure, but failure in a game does not mean a setback but a reasonable step forward in the future. Failing in games has no consequences in the real world, but it has "a cost" in the game world. The person can view it as a lack of skills or a waste of time. Juul (2013) believes the attributions are acknowledged rarely in a non-game context. Players are searching for games that include the chance of failure, although they do not like to fail. The possibility of not being successful is related to the game's enjoyment. It consequently increases the person's interest and the possibility of changing their attitude towards the game (Brühlmann, 2016). In education, it is the goal set by the student/learner; their skills, time investment, and environmental effectiveness determine the success or failure of the task (Panagiotis et al., 2011). Clearly, the topic of failure is somewhat different in the position of a player and a learner but combined with one person who is both a player and learner, the issue of failure might have promising outcomes.

Gamification in foreign language learning can potentially influence how the learning process is executed in practice. The beginning is at the game elements as they create the core of the actions. Special attention is paid to feedback as it provides the most impactful information for the learner and retains its reasonable place in education. Following the idea to use gamification in foreign language education, the choice of a platform plays a crucial role as it decides which of the four communicative language skills will be developed in the English language. Setting a goal makes the learning process meaningful and engaging. As a result, it will change the learner's approach towards the learning process. Besides the "positive" factors also, some "negative" appeared. Their roots are, at the core, the game design elements. Clearly, failure demonstrates not only a negative outcome for the learner but also a positive one. As the digital era is going forward, the same is doing gamification, especially in education.

Learners' attitude

The process of education is affected by several unavoidable factors. One of them is the learners' attitude. Different authors describe an attitude in different ways. Zhu et al. (2013) believe peoples' attitude relates to personal feelings, behaviour and ways of thinking towards an object. Attitude is an individual attribution of a person to create ideas, emotional states, and behaviours that can be positive or negative. In connection with learning, a positive attitude helps the learner better comprehend education's real nature. It helps the learner to be more open towards learning, vastly improving their expectations gain from the learning

process and, most importantly, reducing their level of anxiety. On the other hand, the negative attitude can likely be linked with students' achievements obtained or aimed during learning (Şen, 2013). It is furthermore by the intrinsic motivation (awareness of obligations, responsibilities underlined by intentional attention (Štefanovič, 1964)) of the learner in the forms of high expectations, desires of sufficiency supported (Açıkgöz Ün, 2007; in Şen, 2013).

Attitude can massively improve and contribute to the effectiveness of learning strategies used during the learning process. In our view, it is necessary to point out the connection between learners' attitudes and language learning strategies, which both contribute to successful learning outcomes. According to Oxford (1990), language learning strategies are specific actions of the learner. Make the learning process autonomous, enjoyable, simple, faster, effective, and practically applicable to new situations. Jabbari and Golkar (2014), in their research (The Relationship between EFL Learners' Language Learning Attitudes and Language Learning Strategies), investigated the connection and found that the learners with a positive attitude are using language strategies more than the learners with a negative attitude. As it shows, the connection between learners' attitudes and language learning strategies is deeper and cannot be overlooked, especially in the learning process.

Another aspect influencing learners' attitudes during education is culture. According to Hinkel (1999), culture can be seen as forms of speech act, social organization, and the concept of personal space connected with appropriate gestures understood. Helmová (2019) understands culture in two different concepts. The first one is socio-anthropological, reflected in divergent forms of human life (ex., behaviour, learning). While the second one is more cultural-political reflected in the organization of human work.

Nevertheless, the view of culture is dynamic and constantly changing, undoubtedly, affecting the learning process. The learners' responses towards the target language culture are proven to affect their attitude towards the language itself. Over the years, culture became an essential part of language classrooms, involved in cultural education in foreign language learning (Jabeen, 2011).

Learners' attitude is one of the most influencing parts of education. As was presented above, one aim of learning is to build a good connection to learning. To better understand its real nature, improve its strengths and reduce its weaknesses such as anxiety. A massive contribution to the learning process can be found in the practical use of learning strategies, specifically in the learners' actions, to make the learning process more satisfying and enjoyable. Similarly to the learning strategies, but on a larger scale, the influence of culture is present. Culture, as an inseparable part of foreign language education, is necessary for a learner to understand. After all, it affects their view of the language itself. Both culture and learning strategies are factors that affected the results of the following part of the paper.

RESEARCH

After studying and reviewing an extensive number of sources focused on gamification and its application in the educational sphere, we clarified our objectives and created research questions. The purpose was focused primarily on gathering information and examining the preferences of a learner learning English as a foreign language by using games as one area that can vastly improve their development. We decided to choose a survey and a questionnaire as our main tools to collect all the necessary data in the current situation for our research. We appreciated the valuable answers provided by the participants. It consequently helped us to divide the samples into two groups. They were compared to each other based on different categories, searching for answers to our questions. The following parts will provide a more specific inside view of the previously mentioned fragments of the research.

Research objectives

As far as our research is concerned, one primary and two secondary objectives were set. The goals were both related to our research questions. The main aim was to identify the opinions, attitudes and preferences of English foreign language learners towards specific aspects of computer games and language applications. The first secondary aim was to identify students' attitudes towards gamification in TEFL (teaching English as a foreign language). The second secondary aim compared the attitudes of Slovak and International foreign English learners.

Research questions

According to the objective of our research, four research questions were stated. Each question focused on a different aspect of teaching and learning English as a foreign language. The answers were collected via the survey and questionnaire, providing valuable data and subsequently contributing to one another. The questions were constructed as follows:

RQ1. What types of games are preferred by learners?

RQ2. What forms of feedback do learners prefer in language applications?

RQ3. Is the goal of the game important?

RQ4. Is the learners' attitude toward using gamification in a foreign language education of one group similar or different in comparison to the other group?

Participants

For the purposes of our research, we decided to collect responses from two different groups of people. The first group would be of Slovak origin. Our expectations towards the group were determined around the individual's reliability, willingness to be a part of the research, and ability to communicate easily if a problem occurs. Additionally, the first group needed to have a different version of research tools. The second group would be of foreign origin, mostly

individuals from countries around Slovakia. They were administrated with an English translation of the research tools.

The total number of participants who participated in the research was 126. The sample represented a total number of 63 males and 63 females. The willing participants were of Slovak, Polish, Czech, and Austrian nationalities. They were from the group under 12 years old up to 35 years old and over.

The number of participants of Slovak origin was a total of 73. However, the number was reduced by three since they did not send the responses for the survey. Therefore, they are not included in the final analysis of the work. The 70 Slovak participants were from the age groups less than 12, 13 – 17, and 18 – 24. The sample represented a total number of 39 males and 31 females. A vast majority of the participants (around 60) were from Senica. Participants were students from 5th to 9th grade. The remaining ones were our close friends who were also high school or university students.

The number of participants of foreign origin was in total 53. All participants have sent both research tools. Therefore, the number of responses was not changed. All were included in the final analysis. The 53 foreign participants were from the age groups: less than 12, 13 – 17, 18 – 24, 25 – 34, 35 and over. The sample represented a total number of 24 males and 29 females. They were of Polish, Czech, and Austrian origin. The number of Polish participants was 33, the Czech one was 15, and the Austrian was 5. The remaining participants were our close friends who were also high school or university students.

Research methodology

A research method is a tool used to collect data or evidence for a study to discover new information or better understand an issue. The chosen research design uses qualitative methods. It required more than one research method to be applied, specifically a survey and a questionnaire. Due to the current situation, it was not possible to conduct the research in the way it had been planned. Therefore, an alternative was chosen to identify the phenomenon.

During the research, two methods were used to obtain the information for analysis. The first one was a survey. It consisted of 11 questions, each supplied with a list of choices (in some cases, multiple options were possible) and an opportunity to write your own answer if none of the provided was satisfying. The survey aimed to find out the following:

- the preferred game genres attracting the participants
- specific game used/being used to help the user to improve their English language
- the preferred platform and interface
- which learning activity is the most effective for learning a foreign language
- the ideal type of surrounding/place influencing the effectiveness of learning
- the preferred form of instructions

- which type of feedback is the most valuable and reflected in the actions of the learner
- the interest of learners to use gamification in actual teaching in the class

Its primary function was to give us the background to fully understand the logical process behind the participants' choices. Furthermore, it added additional data for further analysis mentioned in the following chapter.

The second method was a questionnaire comprising 20 statements, each backed up with an ordinal scale to choose the most precise opinion towards the particular statement. It concentrated more on topics such as:

- learners' attitude toward the learning process and computer games
- learner's engagement in computer games
- components of the game (rewards, discovery process, competitiveness, cooperation with other players, self-improvement, etc.) valued and used by the learners to improve their knowledge
- use of strategies during the learning process. The research was conducted in a digital form, more specifically on sites such as Google Forms and Survio. Both the survey and the questionnaire were provided in two different language translations. International participants were given an English translation through Survio due to some countries' regulations regarding using Google services. However, for the local participants, a Slovak questionnaire translation was necessary. The reasons underlining our decision were the current level of English language of the learner and the age of participants.

The questionnaire items were based on three different types of research related to gamification. Aji and Napitupulu's research from 2018 focused on learning achievement and learning motivation, Pektaş and Kepceoğlu's article titled What Do Prospective Teachers Think about Educational Gamification, and Högberg et al. questionnaire focus on information connected with the gameful experience, inspired the essential parts.

The research consisted of several phases:

The first phase was a literature review of all accessible information. It took place throughout the whole research, starting at the beginning of our research on December 2nd 2020. We continuously educated in the area and examined other sources to connect them with recent findings.

The second phase was the creation of our research methods. The general method in our case was the survey, which focused on obtaining data from different participants to understand the background of their choices. According to the theory previously introduced, a collection of questions, statements and choices was created. Additionally, we were very interested to find out the current preferences of people in today's world influenced by informational technologies. On the other hand, the main method was a questionnaire as a tool to find out the answers to our research questions. It was influenced by other foreign research

focused on the topic of gamification. The biggest problem was the research goal, which changed several times, foreign restrictions for using online software, and the current situation in our country. Nevertheless, the final version of the questionnaire was formed in the middle of January 2021. Both survey and questionnaire were administered on January 18th, 2021.

The third phase was collecting data from local and foreign participants. The process of collecting all the necessary data for our research was between January 18th 2021, and April 2nd 2021.

The final phase of the research was the analysis of all collected data. All participants provided useful information valuable for the goal of the research. Continuous analysis of the data provided results and answers to the research questions. They are presented in the final part (part 4.6).

The current situation in our country considerably changed the previous plans of our research.

Action research was the primary goal of our work. However, after long consideration, we decided to leave the idea behind. We are fully aware of the limitations of the methodology we provided. Aspects such as time investment, choice of options, environment, possibilities or form of responses may have influenced the result and data analysed later on.

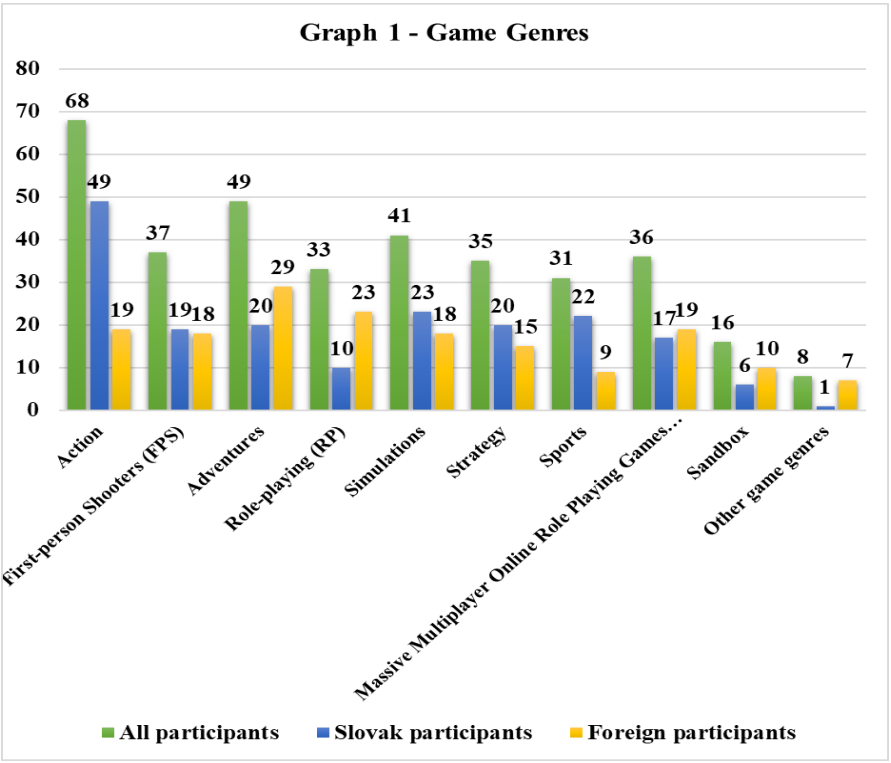
Data analysis

Game genres, examples of games, devices and interface

The first major area the research focused on was related to game genres and specific examples of games used by users to improve their foreign language proficiency. Additionally, the outcomes were connected with several aspects from the theoretical background, considered important for the foreign language learner.

Initially, a more general approach was applied to determine which game area was the most impactful. Participants were able to decide from a wide variety of game genres. Each of them chose not only one but at least three more. Graph 1 indicates that the most preferred game genre for language learners is action, followed by adventures and simulations. According to the results, the Slovak participants are more interested in action games where precise coordination and reaction are required. While the foreign ones are likely to focus more on the genre of adventures, mostly driven by an interactive story focused more on investigation and puzzle-solving. However, the third game genre indicates the need for real-life influence and the interest to develop and experience a moment of an authentic situation since the simulation game genre is more related to real-life activities.

Despite the data (Graph 1) showing the user's preference, it created only a part of the whole picture. To obtain a clear/complete image of the user, we also asked them to provide some examples of games that helped them improve their proficiency in any possible way. Graph 2 points out the most repeated answer, the game with the title Minecraft. We believe three statements can support the reason behind the choice from the questionnaire (Table 1).


Graph 1 - Game Genres
80
70
60
50
40
30
20
10
0
68
49
19
37
19
18
49
20
29
33
10
23
41
23
18
35
20
15
31
22
9
36
17
19
16
6
10
8
1
7
Action
First-person Shooters (FPS)
Adventures
Role-playing (RP)
Simulations
Strategy
Sports
Massive Multiplayer Online Role Playing Games…
Sandbox
Other game genres
All participants
Slovak participants
Foreign participants

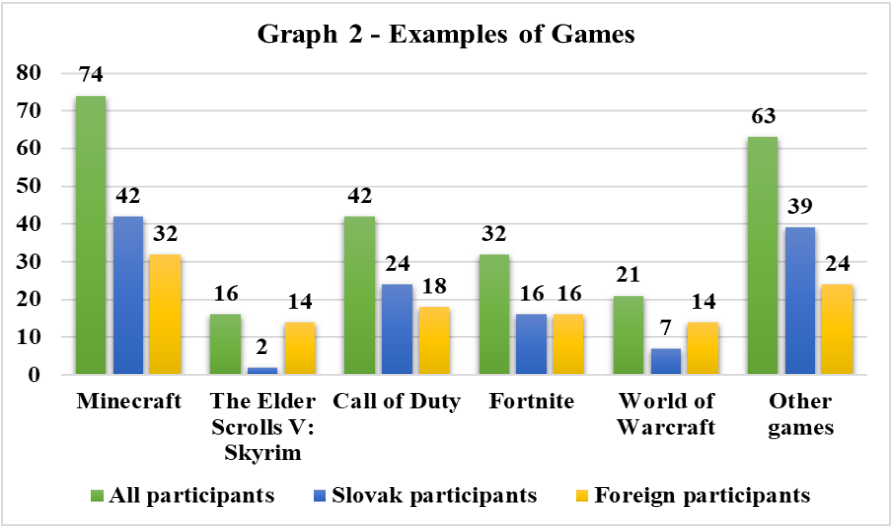

Graph 2 - Examples of Games
80
70
60
50
40
30
20
10
0
74
42
32
16
2
14
42
24
18
32
16
16
21
7
14
63
39
24
Minecraft
The Elder Scrolls V: Skyrim
Call of Duty
Fortnite
World of Warcraft
Other games
All participants
Slovak participants
Foreign participants

Table 1 summarizes the overall data from three items used in the second method of the research. The overall number of responses for the highest choice, Agree, in item 13 was 53, followed by 40 for the option Strongly Agree. Item 16, dealing with learners' interest in learning via PC games, resulted in 59 responses for the option Agree and 41 for Strongly Agree.

Table 1 – Questionnaire Items (All participants – 1st section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
13. I enjoy earning XP (experience) in the game.	40	53	13	11	6
16. Learning English language through PC games is interesting.	41	59	12	4	4
19. When I play a game, it feels like a test of my abilities.	23	61	24	13	2

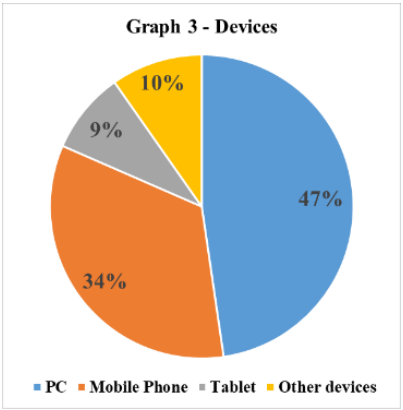
*The number of responses in Table 1 indicates the choices of both Slovak and foreign participants.

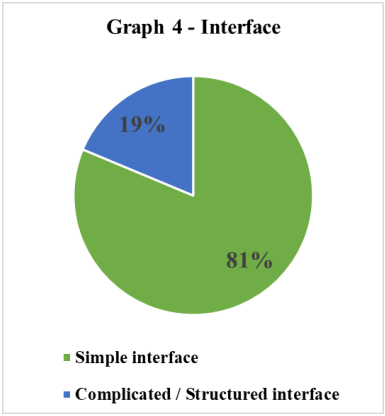
Compared to item 19, when they were asked if playing a game felt like testing their abilities, more than half of the participants (61) agreed. The analysis indicates a positive outcome for both the user's game preference and other data later on. Based on the results in Table 1 and information about the game, the game provides a sufficient amount of experience concerning learning English as a foreign language, specifically in the form of vocabulary (can be related to topics like housing, culture, food and services, and environment) and communication opportunities (if played with other people as collaboration to some project, event, or daily topics), while being supplied with the learners' attitude toward learning a foreign language through PC games as a new opportunity for better outcomes and a possibility to test their current abilities of the language in the foreign language.

Furthermore, to avoid misleading interpretations of the data (Graph 2), the second highest value is connected to the choice of "Other games". After closer examination of the collected data, it was found out the specific examples of the games were lower than the given choices. Therefore, they are not sufficient for us to analyze them. However, the other options are considered to be mentioned as they impacted other data analyzed later. Other options from Graph 2 were Call of Duty, Fortnite, World of Warcraft, and Elder Scrolls V: Skyrim. The overall data shows the third place belonging to Call of Duty, the fourth to Fortnite, while the places were World of Warcraft and Elder Scrolls V: Skyrim. The essential impact towards the results in Graph 2 was ascribed to the general category of the

participants, the age. Depending on the participants' backgrounds and experiences could influence the decision. Since the factor also affected other data. More detailed information will be under the second area, the feedback.

Concerning the theory presented at the beginning of the paper, the participant's choices in both Graph 1 and Graph 2 can be linked and applied to Bartles' taxonomy of player types described in part 1. Language Game Design Elements are mentioned in part 2 since the learners approach depends not only on the possibilities and the aim of the game genres but also on the specific choice of the application. To further underline the statement, participants were asked to express their choice of device (Graph 3) and the interface (working environment of the application) (Graph 4).





Percentages in Graph 3 and Graph 4 indicate the choices of both Slovak and foreign participants

Graphs 3 and 4 specify the choice of the learners for devices and the interface of the particular application. About half of the participants (47%) expressed their decision to use a PC to play games, while 35% used a mobile phone. The percentage results may provide possibilities or adjustments for changing the approach and the process of how English is taught in Slovakia compared to other countries. Suppose the choices of the games used for language learning in Graph 2 and game genres (Graph 1) with the combination of devices are available for language education. In that case, it may influence other factors, such as the learning environment, the possible structure of tasks and activities and learners' attitudes towards the language itself.

In addition, the decision to use a mobile phone for playing games is also represented in Graph 4, where 81% of learners like to work in a simple interface with easy navigation.

The number will also be mentioned in the following section dealing with language learning applications. Nevertheless, the learner's decision might have

been influenced by several factors such as needs, state of mind, opportunities, goals, progress and other features the paper stated in parts 1, 2, and 3.

Language applications, feedback, instructions

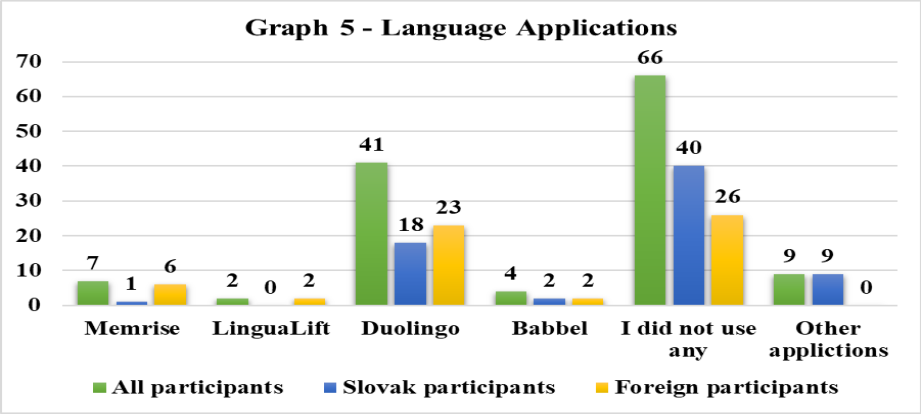
The second area the work was looking closely at was linked to the use of language applications, which primary function is to learn or improve learners' foreign language within all four areas of foreign language skills (speaking, writing, listening, reading).

Simultaneously, the availability of feedback, instructions and their respective forms was analysed and supported by other data from the questionnaire.

Before the next analysis of the collected responses, it is necessary to mention that the users could choose more than one option. In fact, each person was asked to select at least one option. As a result, the bar chart (Graph 5) summarizes the information of both Slovak and Foreign participants towards options of the most known language applications used by foreign language learners. The overall data indicate two options that are repeated several times.

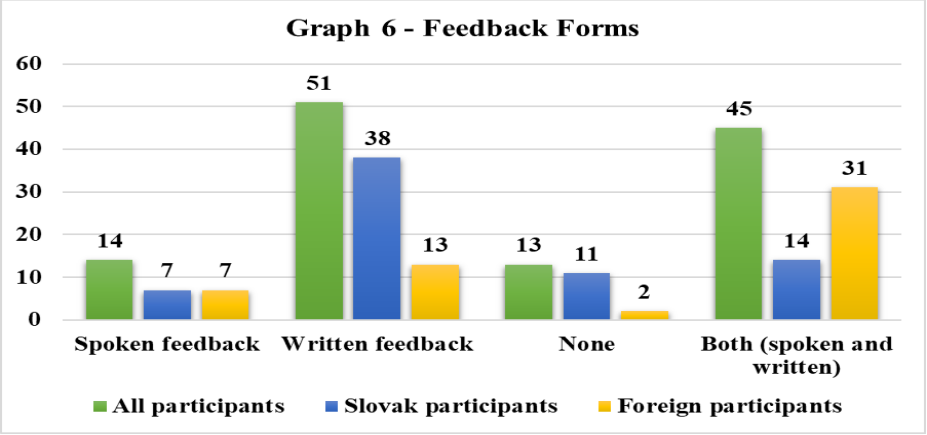
The first one specifies the choice of the application called Duolingo. But the second one signalizes the decision of the participants not to use any language applications.

When taking a closer look at the presented numbers, the option of the application Duolingo is relatively high. After further research, the likely reason is the availability of the application. In the previous section, in the results of Graphs 3 and 4, the mobile phone, followed by choice of a simple interface, represented 81% of the participants under the second-highest option. Indeed, the applications provide a simple and easy way how to learn English as a foreign language because the features such as levels, badges, and leaderboards identified as language game design elements provide a list of options reflecting the interest, engagement and possible change of attitude towards the learning itself.



On the other hand, the option "I did not use any" is also fascinating due to the factors influencing the learning process, such as environment and activities (distributions, forms). Another possible interpretation of the numbers can be linked to learners' attitudes towards the English language and language teaching methods and practices where the learner might not be encouraged or feel unsatisfied in many cases. Thus, they can find playing a game more appealing and fulfilling for their goals in the English language (Table 1, Item no. 16).

Another feature we looked at was feedback and its forms. The question "if you use language apps, do you prefer spoken or written feedback?" related to the language applications mentioned above, the participants answered as follows. Graph 6 shows the ideal form of feedback for the learners. It points out two options, opposite each other in one particular category, age. The first option was written feedback, with 51 answers, whereas the option was mostly selected by Slovak participants, representing 38 answers. On the contrary, the second option combined both spoken and written feedback, with 45 answers, where foreign participants represented 31. The data reflect two groups of learners determined by the category of age, affecting them and their approach to English learning.



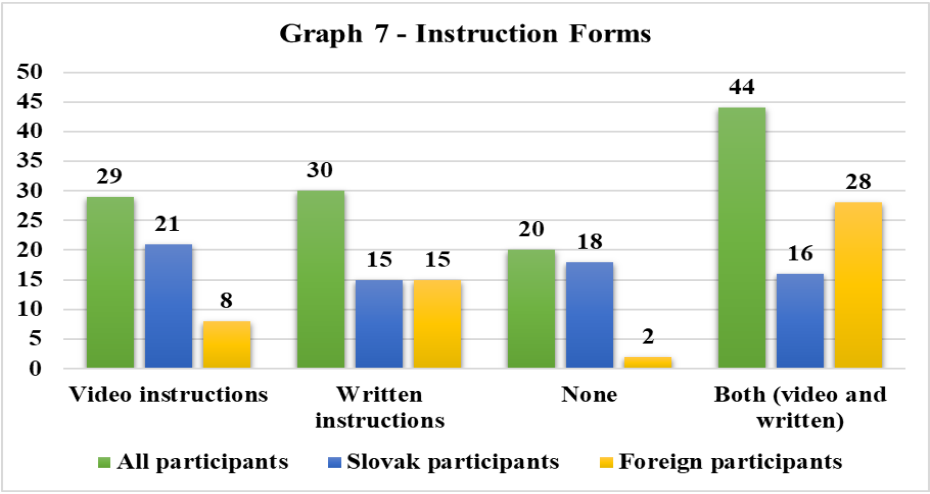
As most of the Slovak group consisted of learners aged 13-17 (60% of the group), it is understandable that the option was affected by the environment where the learning process is taking place. In our case, the place was a state institution, a primary school. The foreign group comprised learners aged 18-24 (72% of the group).

The options of the foreign language participants might have been influenced by two factors: education/life experience and logical gathering of information from different sources and forms for future evaluation and improvement.

Table 3 – Questionnaire Items (Slovak participants – 2nd section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5. When I learn language through the games, it gives me the feeling that I have an instructor.	13	26	19	9	3
9. When I learn language through the games, I am provided with a useful feedback so I can adapt later on.	14	36	17	3	0
18. I prefer the explanation from a teacher instead of AI (artificial intelligence).	20	13	26	9	2

To obtain feedback when using the game as a tool for language learning, we asked them in the questionnaire (item no. 9): "When I learn language through the games, I am provided with useful feedback so I can adapt later on." The summarized results in Tables 2 and 3 highlight the option and usefulness of feedback in games. In Table 2, item no. 9 was addressed positively in both cases (Strongly Agree, Agree) in contrast to Table 3, where the positive options of item no. 9 were followed by a neutral one (Undecided). It seems the Slovak group views the feedback as not sufficient in some cases. The highest numbers show agreement with the statement, the progress and the growth of the user. It is reflected in the interest in using games as a tool for education. The mentioned statement will be discussed later on in the following parts of the analysis.



Similarly to the feedback, considered as a final step of learning, we surveyed the initial one before any activity, the instructions. In the survey, participants responded to the question:

"If you use language apps, do you prefer a video or written instruction?". Graph 7 displays the given choices and results. The numbers are relatively close to each other overall. However, if looked closely, a similar situation appeared. The option of video instructions is higher in one group (21) in comparison to the choice offering combination of both video and written instructions represented by 28 responses.

Because of the different outcomes, additional clarification was necessary. Therefore, close attention was paid to the possible source who offered the instructions and clarified them. Two statements were chosen from the second method used to collect the data, items no. 5 and 18.

Item no. 5 (Table 3), "When I learn language through the games, it gives me the feeling that I have an instructor", in the first group, 26 responses related to the choice agreed. Yet, item no. 18 (Table 3), "I prefer the explanation from a teacher instead of AI (artificial intelligence)", signalized two options close to each other (Strongly Agree and Undecided). It seems the first group relies on the presence of the person, who will guide them, and also on the visual guidance provided, for example, in the form of a video.

On the other hand, the second group (Table 2) had the opposite problem. The choices in item no. 5 were very close to each in three different stages: a positive one (Agree), a neutral one (Undecided), and a negative one (Disagree). While the choice in item no. 18 was neutral.

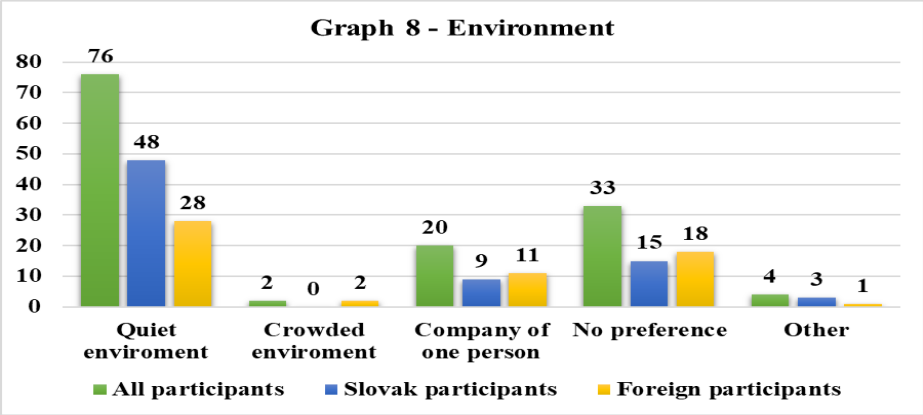
In our opinion, the more likely answer to the phenomena can be identified in the game genres (Graph 1), where the group's dominant outcome was the adventure genre. Namely for the opportunity to do things in our own way, the potential to be self-depended and responsible for our own decisions. As far as it can be seen in item no. 18, the responses are mostly neutral, as the outcome likely depends on the value of the information given to the learner.

Table 2 – Questionnaire Items (Foreign participants – 2nd section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
5. When I learn language through the games, it gives me the feeling that I have an instructor.	6	14	17	14	2
9. When I learn language through the games, I am provided with a useful feedback so I can adapt later on.	13	25	9	4	2
18. I prefer the explanation from a teacher instead of AI (artificial intelligence).	6	13	22	8	4

Environment, activities, goal

The third area studied during the research was related to the learning environment and the specific types of activities preferred/searched by learners for learning or improving language competence. Furthermore, the significance of the activities was analysed under the goal's necessity and the game's main orientation. Once again, the collected data were connected with a group of statements from the questionnaire as they are closely related, providing a clear image of the learner's attitude.



As the work stated at the beginning, the term environment can be interpreted in two different ways. Environment as an in-game feature (Lavoué et al., 2019) or an appropriate space for learning (Kozárová and Gunišová, 2019; in Duchovičová et al., 2019). Regarding the paper, learners were asked what kind of environment they like/prefer when they want to learn. The gathered responses were summarized and visually put into a graphical representation. Graph 8 indicates the options and proper differentiation between Slovak and foreign participants. The highest number overall is associated with the "Quiet environment" choice. The answers show that the participants are likely to learn in a space where they can fully focus without any disturbance. In correlation with the information evaluated in Tables 4 and 5, under items no. 1 and 20, it is clear that if the learner uses games for language learning, the way they are perceived is different.

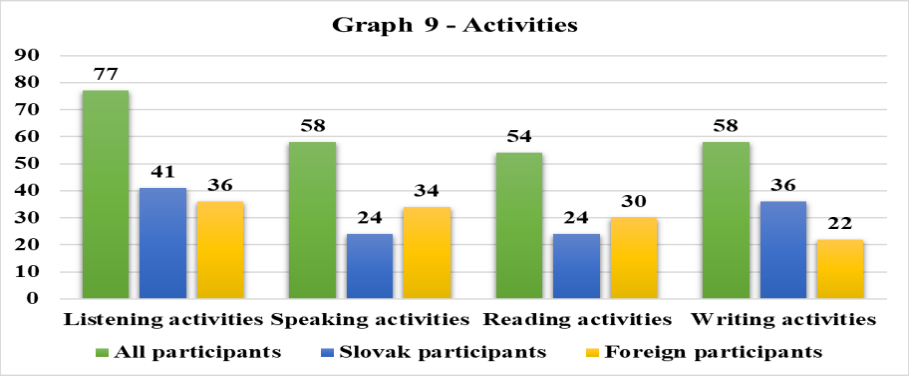
Additionally, according to the responses, it usually catches all their attention when playing a game. The quiet environment plays an important role in the correlation as it may provide the learner with benefits, such as complete concentration, relaxation, improvement opportunities, etc.

The second highest value was the option of "non-prefers environment". It seems not all learners mind being in a quiet, crowded environment or the company of one person. Based on their responses, the place does not impact their actions as they probably can/are used to working and learning in any environment,

regardless of the circumstances. Due to the uncertainty and inability to ask further questions dealing with the participants' choice to clarify the process behind the choice in face-to-face communication makes it impossible to interpret it differently.

Since the option of a "Quiet environment" is dominant in the results of Graph 8, another factor caught our attention. Nevertheless, the outcomes of the third option: "Company of one person", is also interesting because of item no. 8 in Tables 4 and 5. As could be seen, the foreign participants agreed with the result: "The game makes me feel like I have someone to work with.". In comparison, the Slovak participants took a relatively neutral stance towards it. During the interpretation of the results about the environment, it was necessary to consider additional data from both the survey (Graph 8) and the questionnaire (Tables 4 and 5) since they contained valuable information. Firstly, the learning environment where one person is present is not so appealing for the learners as it is assumed they like to learn individually and not in pairs. However, as far as it went to using games, the participants were balancing between two options, Agree and Undecided. Assuming from the data, the participants do not mind accompanying a person when dealing with a game. As the preferred game and game genres displayed in Graphs 1 and 2, they usually require the presence of a person in some situations, for instance: a group mission or precise cooperation where communication is necessary.

The essential part of the learning process in language education is formed by practice in the forms of activities. During the research, the participants could express their preferred activities by choosing from four options, areas according to which the language is taught. The first option was linked to listening activities, the second to speaking tasks, the third to reading activities, and the final to writing activities. Participants could choose more than one option, but they had to select at least one. In Graph 9, the data are put together and categorized into three groups: responses overall in the section, answers of Slovak participants, and finally, responses of foreign participants.



According to Graph 9, the listening activities had the most overall responses (77), with 41 representing the first group and 36 representing the second group. The speaking activities had the same number as the writing activities, presented as 58 choices. The difference between the groups was only 10. The reading activities had the number of responses lower by only 4 compared to speaking and writing activities, with only six answers defining the contrast among the groups. Since the writing task's number is similar to the speaking one, the distinction of groups is 14, which is the highest number difference compared to other choices.

When learning a foreign language, the learner comes across different types of activities and the distinguished ways they are presented. In fact, the activities in games/language games and language applications differ from those used in teaching language in class. Despite paying attention to the previously mentioned data about games, genres and language applications, we can only speculate what kind of activities are present/can be used in the games/language games and language applications.

Based on the theoretical background about the games and several statements from the questionnaire, it seems like the learners have an interest in activities associated with a competitive aspect, an exploration of the world, things, boundaries, cooperation or accompaniment of other people, and finally an opportunity to obtain a reward at the end. The examples of games from Graph 2 and game genres from Table 1 correspond to the collected data about the preferred activities. All options signalize the possible implementation of tasks in various practical realizations. For instance, Bartle's taxonomy of player types represents four types of players; based on the descriptions of each player type, a link between them, game genres and activities could be made. The most evident connection is between listening activities and Adventures, First-person shooters and Massively Multiplayer Online Role-Playing Games, where the person needs to listen carefully to the instructions, evaluate the information, decide which part of the information is the most important to complete the task successfully and hopefully obtain the desired reward.

Undoubtedly, other fitting examples could have been put together. However, for the research, a detailed investigation was placed on the choice with the highest results, the game Minecraft, as it offers a version specialized for education where the learner can practice their skills in activities oriented toward reading and writing. The choice was selected so often could be the reason why.

Indeed, the activities function not only as a tool for the learners to practice new or old knowledge or gain it but also help them achieve a particular outcome, the desired goal. Both groups of participants, the Slovak and the foreign, during the research were never asked directly about the goal of the game or how it was possible to achieve it. Instead, an indirect approach was chosen, specifically in the second method, in the questionnaire, as it allowed an easily accessible way to obtain the information. The goal analysis started with the participants expressing their attitudes towards the statements on their decisions to finish the games due

to the reward at the end and the game grabbing their attention. They were expressed in Tables 4 and 5, under items 10 and 12.

The foreign group, summarized in Table 4 for the question asking if they want to complete the game if there is a reward at the end (item no. 10), replied with 23 answers that they agree with the statement and with three responses less, they strongly agreed. Moving to item 12 with the statement, if it is important to them to do well at the tasks, they responded with 30 repeated answers to the choice Agree. In comparison to the Slovak group abridged in Table 5 where the students for item 10 selected the option of strong agreement (29), with only 5 selecting the second option, Agree. Just as item 12 in the previous group indicated 30 Agree choices, the same situation happened in the Slovak group. The choice was reflected in 31 repeated samples, with 7 representing the difference from the option of strong agreement (24 responses).

Clearly, the participants view the statements similarly, in a positive way. It seemed at the beginning that the game needed to catch the person's attention, assuming they would find out more about it later. When they realize the possibility of a reward at the end, their attitude changes into determination to finish the game and obtain it, considering the reward as a part of the goal or goal itself.

Analyzing the results from the perspective of achievement goal theory, where the desired success is fueled by the vision of accomplishment of a specific goal. It is possible to study the goal and its data in two ways. The first is viewed from the performance perspective and the second from the standpoint of mastery. The apparent tendency of learners to do/offer the best performance in an activity as they can, in contrast to others, helps them achieve the desired outcome. The crucial indicators were from Tables 4 and 5:

- Item 4 deals with a person's inner state to work without restrictions/obstacles limiting their potential performance;
- Item 14 expresses the learner's interest in reducing the negative influences affecting the learning process;
- Item 17 deals with the learner's improvement of actions to be more automatic;
- Item 1 concerns games as a stimulus to perform, progress, and improve learning.

Despite the performance being just one way the data could be studied, the other goal is more oriented toward mastery of the task and its features. Mastery can be achieved in many ways. Three factors were identified as contributing and participating in accomplishing the mastery goal. The evidence was found in the following items:

- Item 9 in Tables 2 and 3 describes learners' ability to adapt to future actions based on the provided feedback;
- Item 18, in similar Tables to item 9, is searching for the preference of who should explain either the teacher or AI (artificial intelligence);
- Item 19 in Table 1 deals with the possibility and availability of testing their abilities.

Before examining the goal in more specific matters, an analysis of the items mentioned above is necessary. The performance of foreign participants is summarized in Table 4. As was said, four statements were associated with the performance. Starting with question 1, the option Agree dominated all the options with 26 responses.

Table 4 - Questionnaire Items (Foreign participants - 3rd section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. The games motivate me to progress and get better in learning.	9	26	11	5	2
4. When I play games, I feel more spontaneous.	19	19	10	5	0
8. The game makes me feel like I have someone to work with.	6	20	15	12	0
10. I want to complete the game if there is a reward at the end.	20	23	7	3	0
12. - It is important to me to do well at the tasks.	12	30	8	3	0
14. I use strategies to learn English well. (Example of strategies: deductive reasoning, practice, memorization, cooperation with others, lowering anxiety, etc.)	10	21	16	4	2
17. When I learn language through the games, it makes my actions seem to be more automatic.	9	26	16	2	0
20. The game usually grabs all my attention.	14	24	6	8	1

The following item dealt with a person's inner state to work without restrictions limiting their potential performance, statement no. 4. It had two options with the same number of responses. Both options, Strongly Agree and Agree, had 19 replies. Completely different situations occurred in item 14 concerning strategies, where 21 participants chose the option Agree. Thus, ending the foreign participants' summarization statement 17 with 26 responses related to the option Agree.

On the other hand, Slovak participants were break-down in Table 5. Just as in the analysis of foreign participants, the Slovak one started with item 1, representing 34 papers with the option Agree, the highest one. Similarly to item 4 in the last part, in Table 5, 26 responses to the option Agree were assigned, with

24 referring to the choice Strongly Agree, with only two answers making the difference between them. For statement no. 14, it was 32 participants chose the option Agree. Lastly, in item 17, dealing with learners' improvement of actions to be more automatic, the Slovak group picked two options with only five responses making the difference. The highest was the choice to Agree with 30, while the second was Strongly Agree with 25.

Table 5 - Questionnaire Items (Slovak participants - 3rd section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
1. The games motivate me to progress and get better in learning.	21	34	7	6	2
4. When I play games, I feel more spontaneous.	24	26	15	4	1
8. The game makes me feel like I have someone to work with.	13	22	26	8	1
10. I want to complete the game if there is a reward at the end.	29	24	12	5	0
12. It is important to me to do well at the tasks.	24	31	10	4	1
14. I use strategies to learn English well. (Example of strategies: deductive reasoning, practice, memorization, cooperation with others, lowering anxiety, etc.)	15	32	17	6	0
17. When I learn language through the games, it makes my actions seem to be more automatic.	25	30	8	4	3
20. The game usually grabs all my attention.	30	23	9	7	1

According to the examined data related to the game's goal, an explanation is necessary to understand the context completely. The final state of a person interested in games is affected/determined by the situation and whether they achieved the game's goal. Based on the researcher's view, two types of goals can be mentioned. The first view of a goal is specific to the game itself. It is the fundamental goal of the game to head every action or decision made by the person. The second is viewed as something set by the person to accomplish their vision. For instance, it can be a particular achievement, reward, desired position in

leaderboards or interaction with somebody. The second view of the goal was considered in connection with the research.

The performance goal displays the contrast of one person's outcome in comparison to others.

Based on the items connected to the performance, the person needs to feel spontaneous without restrictions/obstacles limiting their potential performance since they can prolong the time and postpone the desired outcome. The road to achieving the goal is only sometimes with negative influences. Thus, the person should know how to reduce them without getting harmed. If the person dedicates his time and effort to the goal they want to achieve, the actions can become more automatic, and as a result, it will be easier to reach the desired outcome. From the results, the Slovak and foreign nationalities participants agreed with the statements that the games stimulate them to progress and get better at learning. The game helps them feel more spontaneous. Their actions are more automatic, assuming their language competence is growing. They are aware of some strategies that help them make learning more enjoyable, easier, and less problematic. Nevertheless, other aspects related to the performance goal, specifically associated with items 2 and 3, will be mentioned in Tables 6 and 7 later.

In contrast to the performance goal, the mastery one is more focused on a person's progress towards the goal rather than comparing themselves to other people. According to research dealing with the mastery goal, the evaluation is done through self-improvement and progress. Yet, during the data collection, a question appeared, dealing with the factors which may contribute to and participate in the advancement of mastery goals. The first factor to be identified is feedback. Its importance lies in the ability of the person to adapt their future actions according to the information given by somebody/something else. The participants indicated their agreement with the function of the feedback in the games, helping them in their future adaptation of actions. Because of the variety of preferences of the second factor, the person needs to know who will explain (for example, when a problem occurs and some details are necessary). Thus, it may affect other things like decisions and the person's state of mind when they are considered as aspects influencing the process. The uncertainty of responders towards item 18 is also a signal depending only on them, probably a consequence of their experience or in a situation, they appeared. However, the third factor is the ability and possibility to test one's skill to understand their current status. Once again, they expressed their agreement. Still, the options for additional interpretation remain open.

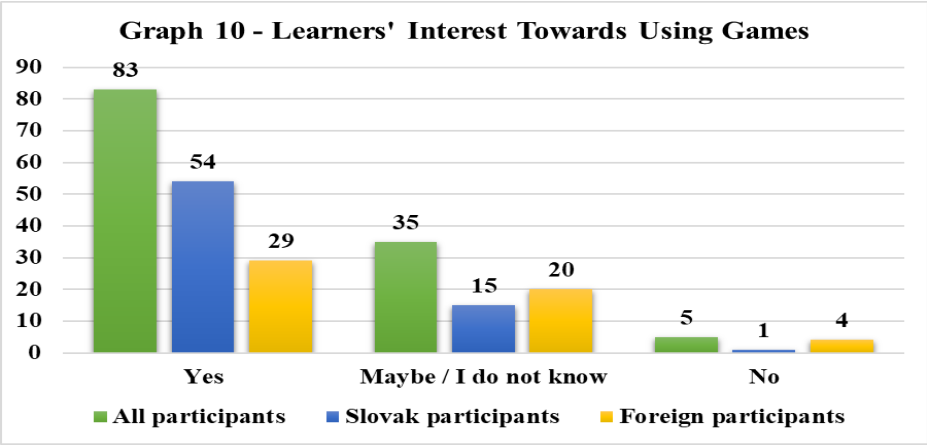
Learners' interest, gamification in education

The final area of the research aimed towards the learner's interest in using games as a tool for language learning and the gamification and its potential application in education not only in the class but also for personal purposes when the learner is learning the language on its own. For the last analysis, almost all previous data were necessary as they unify the complex image of the participants,

their decisions, interest, drive, and many other characteristics influencing the results.

Interest is a powerful driving force that boosts a person's learning to achieve success. During the research, in the survey, the participants were asked if they would be interested in using games for educational purposes, especially as a tool used during lectures.

Based on the provided information about the participants, the analysed data were influenced mainly by the age category. Graph 10 summarizes the collected data about their opinions towards the question, "Would you be more interested/motivated if a game is used during the language learning process?". The responders had to choose from three simple options: Yes, Maybe / I do not know, and No.



Analysing the data, overall, the most frequent option was Yes, represented in 83 responses.

It consisted of 54 Slovak participants and 29 foreign participants, who were remaining part. The second option, which followed the highest one, was the choice Maybe / I do not know. It was present in 35 papers, where the majority were from foreign participants (20), while 15 were from the Slovak group. The third, considered the last, was far from the previous options, as it had five answers overall. In the first option, the majority was of Slovak nationality, in contrast to the third choice, where the generally held position was assigned to participants of foreign origin, represented in four responses, while the remaining part was from the second group.

As was mentioned, the most impactful factor was the age of the respondents. During the analysis of the feedback in language applications, it was defined and described the percentual representation of participants. The final analysis follows up the presented information about the age since they can also be spotted in the

results of Graph 10. Based on the knowledge about the Slovak representatives, the majority was from the age group of 13-17 years old, who made up 60% of the group.

The younger learners seemed to be more interested/inspired to learn when the teacher would use a game instead of the usual things, such as the book or workbook, during the learning process. However, the foreign participants cannot be forgotten during interpreting the results because they also played an important role in the outcome. The group of foreign participants, as it is known, consisted of people aged 18-24, which accounted for 72% of the total population in the group. Their experience, assuming their point of view, played the most dominant role when answering the question. It seems that young adolescents are not sure whether the games should or should not be used for educational purposes. It is believed a similar approach could be applied to the same option, yet, from the position of a teacher, whether they should introduce such a possibility or not. It is not possible to state 100% what the reason was, as additional data would be necessary to fully understand the topic, the attitude and the stance of the participants. But the second option, Maybe / I do not know, was owned by a foreign group. Observing their data in item no. 2, in Table 6, they evaluated the statement, "When I learn language through games, I feel like I know more than traditionally." the outcome is also placed into two groups. One group recognizably stood for the change, while the other one was not decided towards the option, assuming, in their view, the learning process is self-sufficient and fully operational. On the other hand, Slovak and foreign participants fully decided on the third option. Therefore, the age factor was not applied to it.

A complex analytic approach is necessary for obtaining the whole image. The learners might be fragmented between two camps (Yes or Maybe / I do not know), but the overall data should show further facts/at least help to understand the image completely. The initial segments analyzed in the research were game genres and examples of the games (Graphs 1 and 2). They had built the first pillar of using games in language education. The cause behind it was in the results since achieving a state where knowing what the learners like might reduce the waste of effort of the teacher to choose the right genre.

From Graph 2, one game was marked as predominant. It was not surprising as it has a version specialized only for educational purposes. Moving to the second segment, in Tables 2 and 3, items 5 and 9, two essential factors were focused feedback and instructor. The future adaptation from the feedback was positive in both groups. But the issue raised in item 5 in Table 2 where the uncertainty could be spotted, believing it might be one indicator behind Graph 10's choice Maybe / I do not know. The next segment was interpreted as factors influencing the subject from the background. The environment might impact the process, state of mind, or results. Yet, it is less influential than the activities and their variations. On the other hand, they can be viewed as a learner who does not have complete deficits due to the inability of a particular game to cover all four areas of language

development. Although the part mentioned above is insufficient, a piece of additional evidence must be found. In the questionnaire, three items further make clear the given stance.

Table 6 - Questionnaire Items (Foreign participants – 4th section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
2. When I learn language through games, I feel like I know more than when I am learning traditionally.	9	21	18	4	1
3. The game interests me by its competitive aspects.	6	27	11	7	2
6. When I play games, it gives me the feeling that I explore things.	28	15	7	3	0
15. I believe I can master the knowledge and skills of English language.	17	32	4	0	0

In the beginning, in statement 3, asking whether the game interests them by its competitive aspects, the 27 participants of foreign nationality agreed with the statement. In contrast, between participants of Slovak nationality, a fragmentation occurred in options Agree (23) and Undecided (27), with only four answers indicating the gap. In item 6, dealing with exploration, both groups selected a positive, either Strongly Agree or Agree. And finally, in item no. 15, when asked if they believe they can master the knowledge and skills of the English language once again, both chose similar options. What is meant by it is the idea that when a student's commitment or attitude towards a foreign language, in our case English language, is positive regardless of its entry into the items, then the problem is related to specific elements of the game, such as competitiveness or research, even though it was evaluated as positive. Indeed, more information is needed to prevent further speculations from being assigned to the issue, as additional, more focused questions should be asked to determine why the fragmentation happened.

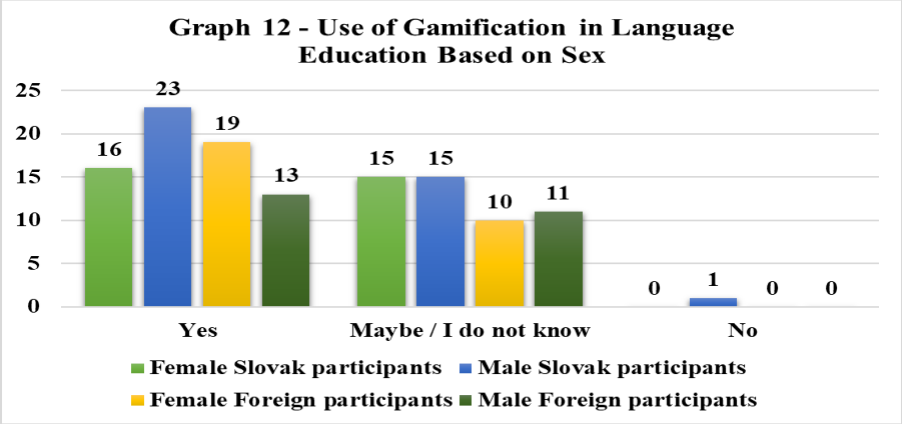
The potential of gamification in the field of education has promising results if it is applied correctly. The final piece, when the research was conducted, was focused on whether the learners see the field of gamification as interesting and beneficial for language learning education and language learning development as a whole. At the end of the survey, the responders were asked to answer the question: "Can you see gamification being useful for enhancing language learning and development?".

Table 7 - Questionnaire Items (Slovak participants - 4th section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
2. When I learn language through games, I feel like I know more than when I am learning traditionally.	24	22	13	9	2
3. The game interests me by its competitive aspects.	18	23	27	1	1
6. When I play games, it gives me the feeling that I explore things.	24	29	10	5	2
15. I believe I can master the knowledge and skills of English language.	27	27	9	4	3

In the same way, as all previously analysed responses from the participants, the data related to the last question were summarized into a bar chart (Graph 11) with three columns, describing both Slovak and foreign participants separately but as one whole group of subjects. From the results, it is evident the responders mostly selected the choice, Yes, making 71 answers overall. The Slovak group represented 39 responses while the foreign one was present in 32, making the difference between them only 7. The uncertain option, Maybe / I do not know, was chosen by 30 participants of Slovak nationality and 21 of foreign nationality. As a result, the overall number of responses picking the undetermined choice was 51. The third option, the negative one, was selected by one person of Slovak nationality, who disagreed with the question.

Particularly in the last question, the analytic eye has caught the attention of one piece of information collected about the participants, the sex. Because of the past and new present works related to games and the population, who is interested in them, examining the category of sex, our curiosity was also concerned by it, especially concerning the field of gamification, where the language game design elements play a crucial role, as was described in part 2. Therefore, Graph 12 indicated a closer visual representation of the data in Graph 11. The analysis focuses on the two main options, Yes and Maybe / I do not know, since they were frequently selected. For the option Yes, female Slovak participants were present in 16 responses, while the male Slovaks were in 23 compared to the foreign group, where the females were in 19, but males were in 13. Moving to the second option, Maybe / I do not know, the variety between the sexes was similar to the previous option. In the case of both female and male Slovak participants, the numbers were the same (15), and for the foreign responders, the difference was made by only one response. Thus, their numbers are considered the same.



Balancing between two camps clarifies harder than it seems to be. In the results of Graph 11, the positive option was the leading force of the chart. Since the number is/might not be surprising, depending on the analyst's point of view. In previous analyses, the connection between particular segments was pointed out, not explicitly but implicitly, drawing a line and joining them together. The starting point was in the first subsection, where the information about game genres (finding out what area is exciting), the process of gaining experience, and the feeling of being able to test the abilities to learn what is the progress, made the learner more engaged. In the second subsection, the following points were the importance of feedback and instructions and their forms. Yet, the impact was in the third subpart with the variety of activities, the possibility of rewards, and the

determination of the learner to give the best performance, focusing on one thing entirely.

Whereas benefiting from the offers and competing with others (fourth subsection) was also necessary. Although they were related to games, their essence can be applied to gamification.

They would enhance language learning and development if implemented correctly and with visible results. Nonetheless, the sceptical or uncertain option also indicated some warning signals. The motive can again be associated with the games due to their position, the core or central point from which many game design elements were born. It has been underlined in both the history and the definitions of the field. The hesitation was found again in the questionnaire in items 7 and 11, Table 8, when they had to select one choice from the five options. The participants in statement 7 picked a positive one (37 for Strongly Agree). Item no. 11, dealing with a language-oriented game, in Table 8, shows the vast majority choosing the uncertain option (50 for Undecided). The idea is implied that when a learner evaluates the toolkit of a game as something non-progressive for them, their attitude towards the action/thing is not positive but negative. For instance, the language-oriented game (item 11) might be interesting for the person when they see it as beneficial for them. Else the learner will be bored and unhappy and subsequently develop a negative attitude towards it.

Therefore, if ignoring the mentioned factors and applying them to language education, the result might not produce a positive outcome but a negative one. Due to the concerns, it is believed the participants have chosen the uncertain option. Indeed, the interpretation can be different, as further examination would be necessary.

Table 8 - Questionnaire Items (All participants - 4th section)

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
7. I feel bored when playing a game with no benefit to me.	37	29	29	22	6
11. I feel happy when playing a language-oriented game.	17	39	50	11	6

*The numbers of responses in Table 8 indicate the choices of both Slovak and foreign participants.

Research results

The subsection will provide information about the evaluation of the works research question, followed by explanations of the limitations of the research, and finally, future recommendations will be presented.

Conclusions

The research results were divided into four areas, similar to part 4.5. It provides answers to research questions.

The first results came from the part about game genres, examples of games, devices and interfaces. The analysis identified three game genres the learners prefer Action games, adventure, and Simulation (Graph 1). Based on the information about the game genres, it was assumed the reasons why they were so above other options were related to the main principles of the game genres and what they can offer to the person.

The problem occurred when they chose/wrote specific examples of games (Graph 2). The dominating option was the first one (Minecraft). The problem was hidden behind the game genres since, according to the information, the game is from the Sandbox genre despite Graph 1 showing the Sandbox being behind the other options. As a result, we had to look closely at the game itself and what it offers and link it to the genres. The examination showed that the game provides features similar to the other genres. Another possibility we had in our minds was whether the participants knew which genre it belonged to.

Furthermore, Table 1 shows positive results in all three statements that helped during the interpretation in the first and the following parts. The results of Graphs 3 and 4 associated with tools and working environment provided information about the learners preferring devices such as PC and Mobile Phones but with a simple working environment. The outcomes affected the data in the second part.

The second result was related to language applications, feedback, and instructions. The collected data about language applications highlighted two options: Duolingo and I did not use any (Graph 5). Thanks to the information from the previous section, it was easier to find why the options were so popular. In the case of Duolingo, it was assumed that the availability and the simple interface appealed to the learner who likes learning through it. While in the case of the other learner (who chose the other option), it was the preference to use games for educational purposes. Moving to more specific features, the feedback results (Graph 6) indicated two options preferred differently by both groups (written feedback or a combination of written and spoken feedback). The age of the participants influenced the outcome in Graph 6 and their physical representation in the groups. The different situation happened with instructions in Graph 7, where three options were highlighted, but after closer examination, it was found that the group representation was either different or similar. Compared to the information in Tables 2 and 3, some data indicated a clear answer, but some were balancing between two options (usually between Agree and Undecided). Indeed, the feedback in the game was identified as impactful later on when the goal was described.

The third result was dealing with the preferred learning environment, activities and their forms, and goal/s in the game. The first area was the learning environment, where the majority of the responders selected the option of a quiet

environment. Since they had no opportunity to explain their choice, fully understand the option and interpret it accurately, the choice was correlated with data from Tables 4 and 5, statements no. 1 and 2 describing the use of games for learning. But the factor which was interesting during the analysis was the third option, "Company of one person". After a closer look, it was identified that the learners like a person's company when working with the game. The data from the first analysis also clarified the choice as the preferred genres usually require somebody with whom they will work. The second field studied what types of activities a learner likes when learning a new language. From Graph 9, the highest-voted option was "Listening activities." Despite the other options' votes being close to each other. However, the information was not sufficient. A connection was searched with the games, relying on the data results about responders using games for learning purposes. Representation of activities was formed by creating a link between the theory about the player types and the first section's analysis.

A fitting example was the selected option from Graph 2, which offers a version specialized for education. It might be why the option's votes were so high. The final area investigated the necessity of a goal in the game. The topic was never explicitly mentioned in the research tools. It was studied with the data collected about the games and how the responders approach them. The factors assigned to the goal were from Tables 2, 3, 4, and 5. It was: the reward of the game, the feedback and future adaptation, the improvement of actions after investing time into the game, the view of games as a stimulus, the state of being spontaneous, the figure who provides explanations, the access to test abilities, and finally, the strategies to reduce the negative influences affecting the learning process. All factors created a web of actions and outcomes, clarifying the necessity/importance of the goal in the game. The outcomes showed that the learner could adapt to their future actions based on the given feedback. As a result, the person might be able to reach the game's goal, to make their actions meaningful and useful. However, special research focusing only on the game goal would be necessary to understand its essential being of it.

The final results were a correlation of all previous data put into the analysis of two core factors, the learners' interest towards using games in education and the use of gamification in teaching. Starting with the initial one, the participants were directly asked whether they would be interested in using games for educational purposes, especially as a tool used during lectures. The vast majority would be interested in such a form of education. Nevertheless, the option was affected by the age of the people. Younger participants also expressed their certainty clearly in Tables 6 and 7, under statements no. 2. It signalized a possible message for the teachers/instructors to adopt new tools for foreign language education. On the other hand, the "older" participants were balancing between two camps, one standing for the "green light" while the other one was not 100% sure if they should agree or not. The evidence was scattered across the whole research. For analysing the balancing of participants' data such as game genres and examples of the games

(Graphs 1 and 2), feedback and instructor in items no. 5 and 9 (Tables 2 and 3), environment (Graph 8), data from Table 6 and 7 were taken into consideration. However, the lack of information prevented the creation and assignment of a clear image towards the issue, as further, more targeted questions had to be asked about the issue to find out why the fragmentation occurred.

Similarly to the initial one, the following part appeared in the same situation. Graph 11 summarized participants' responses to the question: "Can you see gamification being useful for enhancing language learning and development?" from the results, the same options dominated the chart. The majority voted for the option Yes, whereas the remaining were undecided. The groups of participants were close, so a closer look had to be taken at the data from previous parts again. Since the games are the primary source for gamification due to their position, being the core or central point from which many game design elements were born. During the analysis, attention was paid to elements that can be applied for gamification, the ones the responders liked. The identified features were: the information about game genres (finding out what area is exciting), the process of gaining experience, the access to test the abilities to learn what is their progress, the engaging aspect of games, the feedback, the instructions, the goals, the benefiting from the offers and competing with others. However, in some cases, the responses needed to be clearer. Even an examination where the primary factor was sex did not show or provide any answers. Therefore, it is not possible with the current data to state whether it would be beneficial. Regardless of the outcome, it seems the learning attitude of the groups is similar in most cases. The most repeated choices overall were Strongly Agree, Agree, and Undecided. The results indicate the potential to use gamification in language education, as their attitude towards the English language is positive, and they want to improve. Their attitude observed from the statements related to games also showed positive results. Yet, the similarity in their attitudes is doubted due to factors such as age and experience. Additional explanations and findings would be necessary to delve further into the comparison between the groups of participants.

Research data limitations

The study limitations began with limiting access to the responders. The Slovak republic and other foreign countries were still under lockdown when the research was conducted. Every single opportunity which provided any number of responders was taken into consideration. Yet, in most cases, the digital form was ignored due to the uninterest in being a part of the research, simply the person having no free time for it, and the physical option was possible because of the restrictions. Another factor was the inability to obtain explanations from the respondents to clarify some of their choices. The research was primarily focused on pc games and other related features. The missing piece was the application of the features into real-life foreign language education, as was the original plan and the third method for data collection. As a result, the data in some places correlated

differently than expected during the analysis. The work is aware of the gaps. Therefore, the results must be interpreted with caution, and the number of limitations should be considered.

Research recommendations

The research gathered opinions about the game being used in education, the preferences of game genres, learning devices, working environment, forms of feedback and instructions, and elements of the game necessary for gamification. If future researchers are interested in the field, practical application of the data is needed. Additionally, a wider scope of respondents would be required to obtain a clear data image. The international scale of the samples from all age groups could provide more reliable data.

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