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Mobile Technology and Generation Z in the English Language Classroom—A Preliminary Study

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Abstract: Every generation of students has different characteristics that reflect the conditions of the time period they were growing in. It is important for educators from all fields of study, especially English language teachers, to understand the generational differences and the learning preferences of students in order to create productive learning environments. In today's technology driven era, students have different learning needs in comparison with their predecessors. To enhance language learning in the new generation, it is recommended to use mobile technology in class. Mobile devices and applications offer a wide range of activities that support language learning. The aim of this study was to discover if the students using mobile devices in the class got higher scores in tests than the students using traditional methods. The methods included pre- and post-tests, as well as a questionnaire survey. The results of this study reveal that the use of a mobile application had a positive effect on students' achievement results as far as the vocabulary learning was concerned. The students using the app seemed to retain more words than the students in the control group. Furthermore, the results of the questionnaire showed that using the app was more enjoyable for students than the traditional teaching methods. In addition, it contributed to collaborative learning. However, the results also indicate that being a Generation Z student does not make him/her automatically interested in using mobile applications in the process of language acquisition. Considering the small number of participants, further studies are planned to confirm the results from the current preliminary study.

Keywords: Generation Z; constructivism; mobile learning; mobile learning application

1. Introduction

Today's students represent a generation that grew up with new technology. They have spent their lives surrounded by many digital tools that are integral parts of their lives. As a result of this ubiquitous environment, students these days think and process information differently from their predecessors. This is because the thinking patterns of the new generation have changed [1].

Schroer [2] agrees with this statement and claims that a highly diverse environment and a student's interaction with it make schools more diverse than ever. This new generation of students, having grown up with highly sophisticated media, is granted more Internet savviness than their forbearers. Young people's use of information and communication technology (ICT) differentiates them from previous generations of students. The differences are so visible that Prensky is convinced that the nature of education must change in order to accommodate the skills and the interests of the new generation [1].

In response to the new information era, educators, including English language teachers, are encouraged to use mobile technology for educational purposes. However, how does this era influence learning methods and student preferences? Is it important to use mobile technology in the current process of language learning? One possible answer is linked to the increasingly pervasive ownership of a smartphone and its ubiquitous, easy character manipulation that encourages people to use their smartphones in many different situations throughout the day. Ubiquitous and multi-functional mobile devices therefore create potential for powerful learning environments where information can be easily shared [3].

In order to meet the needs of students and promote active learning, English language teachers should provide mobile assisted language learning. Mobile devices and apps represent effective tools for English teachers to engage and encourage students to broaden their knowledge and language skills with the aim of making learning more meaningful and effective. The use of mobile devices for educational purposes promotes learning by facilitating communication and information sharing. Furthermore, the use of mobile technology seems to increase creativity and motivation among students, as it supports interaction between peers [4].

The aim of this study was to prove that the era in which people live influences student needs, expectations, learning styles, and preferences of learning methods and tools. This study explores theoretical information about different generations, which shows the differences among them. Another important aim of this study was to demonstrate that using mobile devices in the English learning process is beneficial. This was done through the comparison of test scores of an experiment group using mobile devices to the test scores of the control group. In this pilot study, the quiz-based platform Kahoot was used to help enhance learning vocabulary. There were 20 Generation Z students with B1 level English participating in the current study.

The research question of this study was as follows: Is the implementation of mobile devices in foreign language learning process effective? The research question was supplemented by other additional questions provided in a questionnaire in order to identify students' perceptions of mobile learning and to improve the vocabulary acquisition process.

2. Literature Review

In order to understand the importance of creating new, relevant, and productive learning environments for the new generation of students, it is necessary to understand that every generation has specific characteristics formed by the conditions under which the people grew. Furthermore, these particular conditions influence expectations and learning styles for every generation of students.

2.1. Different Generation, Different Learning Preference

There are currently five general trends and social patterns identified by sociologists and referred to as: Traditionals, Baby boomers, Generation X, Generation Y, and Generation Z. All of these generations grew up under different economic and cultural conditions, and all have different preferences and expectations as learners [5]. According to Levonius [6], how learners are raised and educated affects their perception of formal learning, and this helps create distinct learning styles for that generation. In order to accommodate the learning needs of students, it is important to know the preferences and the expectations coming out of the era in which they were raised.

For example, Traditionals, born between 1925 and 1945, were raised in times of war and conquest, therefore they learned to value austerity [6,7] Because members of this generation grew up in the teacher-centric educational system, they often prefer to work in the background rather than speak up or engage in debates [8]. They favor instructor-driven lectures and raise their hands to ask permission to speak. They do not like to be surprised; hence, lecturers should provide them with a structured and predictable class [6].

The following generation was the Baby boomers, born between 1946 and 1964 [7]. Baby boomers work hard, put pressure on themselves, and work extremely long hours, often at the expense of their

private lives [6]. This is the reason why Cilliers [8] calls them workaholics. They prefer democratic classroom environments and enjoy working collectively, as they have a spirit of cooperation. On one hand, they enjoy interacting with others and face-to-face work, but on the other hand, they prefer to experiment with new skills independently. Lecturers should provide them with group interactions and discussions.

Thirdly, Generation X comprises people born between 1965 and 1980. These people work hard, and they want to have the freedom to make their own decisions. In the classroom settings, Generation X is reasonably tech savvy, wants answers, prefers openness, takes responsibility, and is comfortable with authority [7]. According to Levonius [6], Generation X views learning as an independent, self-directed activity. Educators should provide them with fun, relevant activities and help them understand what is in it for them, because they are "reality driven". Moreover, clear instructions should be provided, and trainers should get to the point quickly, because this generation of students tends to be impulsive and impatient.

Cook and Macaulay [7] describe the fourth generation as Generation Y, born between 1981 and 1999. People from this generation are the most educated in history [8]. Millennials, as they are also known, favor participatory, activity-based group work and collaborative styles of learning, working, and problem solving, although they are accustomed to being evaluated on an individual level. They favor learning by experience and regular coaching and want immediate feedback but are not disposed to receiving negative feedback. This is the first generation using technology for their entire lives, and they expect to use it in the classroom setting. Network learning and e-learning are particularly comfortable for them. Generation Y is mostly connected and online, which is the reason for their social and community awareness. Information about the different social patterns mentioned above is very general and can serve a teacher from any field of study. In particular, the requirements of how to educate students from every generation also perfectly apply in the process of English language learning. Understanding student preferences can help to enhance language learning by using the appropriate methods, techniques, and tools of learning. However, all generational groups have their unique characteristics that result from the time period they grew up in. Despite sharing some characteristics, no one solution exists to accommodate a learning preference for all generations, as they are chiefly different when it comes to their learning styles.

Besides all this, some authors claim that the fifth generation—the one currently attending schools—is the most diverse ever [1,2]. This new generation of students is growing up in a very different environment from the previous generations, and as a result, thinking, preferences, expectations, and learning styles have changed completely.

2.2. Who is the Fifth Generation?

As mentioned above, previous generations were very different from the Z generation. This is the main reason why the nature of education should be innovated, i.e., in order to meet the needs of current students and to help raise the level of learning.

Generation Z, born after 2000, is the first generation born into the Internet connected world [8]. Rothman [5] describes them as people who come from smaller families with older parents holding traditional values. Their lives have been scheduled, monitored, and protected.

A few of their nicknames include N generation (for Net), D generation (for Digital), V generation (for Viral), or the Google generation. According to Cruz, these nicknames all have a common denominator—ICT [9]. Prensky [1] considers the name "Digital Natives" to be the most useful designation for students living their lives immersed in technology. They are tech-savvy and favor communication via technology rather than direct contact with people. Since they have used different technologies from a very young age, it is a seamless part of their lives. Recent studies [5] show that teenagers use their smartphones for varied purposes, such as checking the time, getting directions, or taking photos.

Other research [1,5] has found that the brains of Generation Z are structurally different to those of previous generations. This is the result of how we use our brains to respond to our environment. Generation Z has wired itself to sophisticated, complex visual imagery. Hence, the part of the brain responsible for visual ability is far more developed, resulting in visual forms of learning being more effective. This generation of student favors interactive games, collaborative projects, experiments, challenges, and anything that can be tried or seen [5].

It is said of the students currently attending school that they are characterized as experts in understanding technology, socially open through the use of technology, fast and impatient, and interactive and resilient multi-taskers [9]. Rothman [5] does not agree, though, with the ultimate definition of "multi-tasker" and states that the human brain has a limited ability to multitask. Therefore, she finds "task-switchers" to be more appropriate when describing this new generation. The current generation is better than any previous generation when it comes to task switching, but one side effect of this is the inability to focus on and analyze complex information. This point should be considered when preparing lesson activities.

Compared to earlier generations, the attention span of Generation Z is more limited, caused by the continuous interaction with the multimedia environment, which predisposes the brain with a shortened attention span. In the classroom, the average student attention span is seven to ten minutes. Nowadays, teenagers want to read less than 20% of a text because they want to get to the point as fast as possible. This is why they favor learning on the Internet over using paper-based materials [5].

It is also noted that, in the process of education, Generation Z students are kinaesthetic, experimental learners with a need for interactive, fast delivered multimedia content. They need clear goals, challenges, feedback, and rewards. As they have a short attention span, learning needs to be delivered in small parts, which can be done by task switching. This generation learns more effectively by experimentation, but they still prefer quick answers over a longer problem solving approach. They have constant access to information, but they need to learn skills of discovery, curation, and management. Generation Z students favor creative work in small groups. They need options to choose from so that learning can be personalized and make them more independent learners than previous generations [5].

Based on the above, it can be said that Prensky [1] and Rothman [5] were accurate when they claimed that Generation Z was the most different ever. It is the first generation that has never known a world without the Internet. Their lives are affected by its use, and they cannot imagine living without it, because it has become a natural part of their lives. People of this generation have a low tolerance for being without digital resources, as they use technology to find information from all the different areas of their life, including education. However, "googling" the solution for every problem causes a lack of critical thinking. In the past, books and educators were the most frequent sources of information. This has changed dramatically, as the Generation Z students prefer technology over books, and they expect this to be the case in the education process as well. Regarding this, teachers need to update the traditional methods of teaching and make the learning environment more appropriate to modern students.

Wang [10] is convinced this can be achieved by using ICT in the class. According to him, it is necessary to support students in the use of mobile devices in the education process, including English language learning, rather than making it forbidden. The banning of phones in the classroom can have several non-beneficial results, such as surreptitious use in the classroom, separation from the student's "real" life, or the perception of mobile devices as non-learning tools. On the contrary, the use of mobile devices in the classroom can have a number of positive outcomes, including integration of multimodal learning tasks, collaborative classroom activities, authentic resources through apps and online sites, personalized learning, digital literacy, and out-of-school lifelong learning.

Common use of mobile devices in the classroom has led to the creation of a field called Mobile Assisted Language Learning (MALL), which, according to Hashim, brings new methods that allow learners to learn on the move and to shape their learning styles [11].

2.3. What is MALL?

There are many different definitions of MALL; however, some authors claim that MALL refers to learning while moving around or using mobile devices to learn something. The ubiquitous nature of MALL leads to advantages such as sharing information, learning without space constraints, and learning in a real context. The classroom is no longer the only learning environment, as students become part of the context and interact with their peers [10].

The key attributes of mobile learning improve the opportunity to promote learning, which is personalized, situated, authentic, spontaneous, collaborative, and contain the learner at the center of the learning process [12]. The primary motive for m-learning is a mutual combination of learning and mobile technology in such a way that learning materials can be used both inside and outside of the classroom [13].

Nowadays, an increasing number of students use apps to support their language learning. As vocabulary is one of the most important aspects of language learning, the primary area of language learning for which learners use apps is vocabulary. Many language learners use apps informally rather than in planned study sessions. In formal learning, the difficulty lies with the teacher to choose the right app suited to the particular level of learner [14].

For instance, Klimova [15] states that a mobile application designed and based on students' needs and continuously facilitated by a teacher is effective in the enhancement of students' performance and contributes to positive learning outcomes. The same is true for the study by Rezaei et al. [16] or Mahdi [17]. In addition, the students using the app seem to retain more words than the students in the control group. This finding was confirmed in a study by Wu [18], who claims that his students who used a mobile app could remember 89 more words than the students in the control group.

MALL is a student approach that includes the theory of constructivism, the main purposes of which are to develop critical thinking ability, enhance learning motivation, and increase learning outcomes. This theory trains students to be independent and self-directed learners [19]. It is also claimed that constructivism can be supported by the integration of mobile technology into the process of education [20].

An experiment dealing with a constructivism-based mobile application for English as a foreign language (EFL) vocabulary learning conducted by Wang and Suwanthep [21] indicated that more than 68% of students from their experimental group preferred the use of mobile applications in the process of vocabulary acquisition compared to traditional methods. This was also confirmed by Davie and Hilber [19], whose students found the use of the smartphone app Quizlet to learn English vocabulary an efficient and enjoyable learning method. Furthermore, the app contributed to collaborative learning, which is in line with the principles of constructivism.

Regarding the fact that many authors agree on the potential beneficial results of mobile technology usage in the class, it should be noted that mobile assisted language learning creates perfect conditions for Generation Z students to bring their learning to a higher level. Mobile devices have become an integral part of their lives; they use them in different situations and expect them to be used in school settings, too. Using mobile devices can help students to construct their own knowledge and develop their learning.

2.4. A Constructivist-Mobile Learning Environment

Constructivism represents the shift from an education based on behaviorism to an education based on cognitive theory [22]. Piaget, the father of constructivism (1896–1980), suggested that the learner needs to be an active creator in constructing knowledge. Students need to know how to learn by taking new information and shaping it into an understanding. Constructivism embraces a top-down instructional methodology, which means that, rather than teaching all the details that lead to the main idea, instead, students discover the main idea, and after that, details are derived. In other words, constructivism is in the student's mind—they construct reality based on their own experiences.

Regarding this, experience is very important in constructivism, thus teaching and learning processes should be related to the practical world [23].

Because mobile devices are neutral to teaching and learning theories, they can be used with traditional learning theories that focus on repetition and drills or with new learning theories such as constructivism. Many authors view mobile technology as a tool that can be used for the development of higher thinking skills [24]. Technological integration can effectively support constructivism. He is convinced that constructivism is the strongest theory supporting the activation of mobile technology roles in the learning process [25].

The best learning happens in the middle of social interaction. That is why constructivism in a technology environment promotes the full potential of technology for enhancing learning. Mobile devices allow learners the opportunity to collaborate in the creation of knowledge and the sharing of information among their peers. The advantage of mobile learning can be gained through collaborative, contextual, and constructivist learning environments. Teachers are responsible for helping and guiding learners throughout knowledge acquisition and for motivating them to develop their current skill level. In this case, learners are seen as active knowledge constructors [26].

As mentioned above, contemporary students favor learning through multimedia, clear goals, challenges, feedback, and rewards. This is offered through mobile assisted language learning, which has the features of constructivist learning. The constructivist mobile learning method can be easily used in EFL classes as well, and it can help students to develop their learning.

With the hope that students will use their personal devices for the learning purpose, it is important for teachers to use mobile devices in the classroom to enhance learning but also to model their use for learning in general [14].

2.5. The Teacher's Role

The primary key to developing students' digital competence is determined by the technological and the pedagogical skills of teachers. Their information and communication technology competencies remain a crucial element for educational development. However, several studies have explored that educators view the use of mobile devices in the classroom as harmful to learning because of their distracting nature [14]. This opinion can be influenced by an inadequate competence and teachers' lack of confidence in the field of ICT [9]. Regarding this matter, in 2011, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) published a document for states that had not yet created any specific recommendations about what their teachers should know in relation with the use of ICTs in education. To this end, UNESCO defined three levels of ICT competencies for teacher education, including technology literacy, knowledge deepening, and knowledge creation, which correspond to goals for national policies on future education [27].

With mobile devices in the classroom, the teachers play a more active role, and they need to become designers of learning experiences for their students [28]. Even if students are proficient users of their personal devices, studies show that, without guidance, they may struggle to use them effectively. One of the roles of the teacher is to bring the students to see the potential of mobile learning and to see the potential of becoming a personally empowered learner with the possibility of becoming part of an online community. It can be achieved in several ways, such as using classroom time to allow students to discuss their learning experience outside the school, enabling students to ask questions related to their learning online, or encouraging students to seek out and recommend online resources they find useful. This approach could lead to discussions on the advantages of different apps or services, potentially increasing the motivation of the students. In a classroom in which students are fully engaged in the learning process, there are unlikely to be bored or distracted students. Introducing mobile devices as a new teaching and learning tool follows an instructional pattern where the teacher is a guide and facilitator. It is advisable to use mobile phones in language learning for a short period of time with follow-up activities built around information generated by the mobile use [14].

It is up to teachers to learn how to incorporate mobile phones in their routines, to become the role model, and to raise the motivation of students to use mobile devices as learning tools. Examples of mobile assisted language learning and its results are demonstrated in the following chapters.

3. Materials and Methods

3.1. Participants

Twenty second-year students at a secondary vocational school for gastronomy and tourism participated in the current study during two 45 min lessons. The participants attended an English language course for 3 h per week. The curriculum was based on a textbook called "Solutions". It contains 10 units divided into different topics. The current topic of study was "crime scene". The participants were divided into two groups; 10 students were enrolled in the control group (the non-mobile application group), and 10 students in the experimental group (the mobile application group). There were 9 girls and 1 boy in each group. Their English level was B1 (intermediate level of English) according to the Common European Reference Framework for languages (CERF) [29].

3.2. Study Design

During the research, quantitative data were collected. The aim of the quantitative study was to compare the test results of one group using traditional learning methods of vocabulary acquisition with another group using mobile devices in the learning process. The experimental group test score was expected to be higher than the test score of the control group. This expectation was based on the research that cites that the use of mobile technology improves the learning performance and the motivation of students. For example, Wang [10] wrote that more than 75% of students who participated in university experiments felt they had learned something from mobile learning activities provided in the classroom. In order to find out students' opinions towards using the constructivism-based mobile application, the questionnaire was conducted.

In order to support the study, the current research collected quantitative data gathered from two vocabulary tests—a pre-test and a post-test. The vocabulary test was arranged according to the multiple test approach. Twenty-three words were selected randomly from the textbook exercises dealing with the topic of crime scenes. The test had four parts: matching the definition, filling the gap, translation, and filling the gap with the given letters. The purpose of the pre-test was to determine whether the vocabulary knowledge of both groups was at the same proficiency level. The post-test aimed at examining the effects of using the constructivism-based vocabulary learning mobile application.

In this pilot study, constructivism-based mobile application treatment was used. Through the Kahoot application, students from the experimental group could learn new vocabulary and their meaning. This application uses educational trends including gamification, student engagement, and real time feedback. To participate, Kahoot requires a mobile device to run its website. Students can join the game by entering a generated game code. There is the possibility to play in individual or team modes. In this case, the team mode was used.

Students were divided into 5 groups so that they could easily interact with their peers in the process of vocabulary achievement. Each group created a nickname that was later displayed on the screen. The teacher made a quiz including 15 multiple choice questions focused on vocabulary. The experimental groups were supposed to choose one correct definition of the word out of a possible four definitions. The correct answer was shown immediately after each group had chosen the definition, which meant that students got immediate feedback, and they had the possibility to compare their responses with Kahoot results. Afterwards, they were asked to explain their choice and to make up the own definitions of the target words given in the quiz. As the students were working in couples, they found it easier and more enjoyable to bring new definitions. There was also space to ask questions regarding what was not clear. The principle of constructivist learning was used as the students got the outcomes, and based on those outcomes, they were supposed to create their own knowledge.

The group with the highest number of correct answers in the shortest period of time got the final high score and was the winner of the quiz.

After finishing the quiz, students from the experimental group were asked questions connected to the topic of "crime scene", and they were supposed to use the target words learned through the previous activity. It led to better understanding and memorization of the meaning of the words. Students from the experimental group were also given questionnaires with clear close-ended questions. The purpose was to elicit students' opinions on the Kahoot application.

Meanwhile, the control group adopted the traditional vocabulary learning approach. This meant that the participants went through the article provided in the textbook, and they were supposed to find out and explain the meaning of the target words by using a dictionary. The control group was requested to review the target words through finishing the exercises in the textbook and workbook, including answering the questions, matching the definition, and filling the gap. In the next lesson, both groups were tested on their vocabulary achievement. The data from the experimental group and the control group were collected and the results were compared; they are described below.

4. Results and Discussion

The results from the statistics of the control group and the experimental group in the pre-test and the post-test as well as the students' opinions on using the constructivism-based application are presented in the following tables.

As is shown in Table 1, the mean scores of the post-test of the two groups were 87% and 69%. As can be seen, in both groups, there were differences between the pre-test and the post-test scores. Expectedly, the values of the post-test scores were higher. It proves that both groups improved their vocabulary learning, but the group that employed the mobile application in the process of vocabulary achievement learned more than the control group.

Table 1. A comparison of the two test scores between the experimental group and the control group.

Group	Pre-Test Score	Post-Test Score	Differences Between the Two Tests
experimental group	53%	87%	34%
control group	51%	69%	18%

The quantitative data analysis indicates that the effects of the vocabulary learning mobile application were as positive as expected. This is evidenced by the fact that the score in the vocabulary test of the experimental group was higher than the score of the control group. Therefore, the answer to the research question is that the implementation of mobile devices in the process of language learning is useful. The picture produced from this pilot study seems to indicate that the students using their mobile devices in the English language class are more likely to understand and remember the meaning of words, which leads to a further application of vocabulary knowledge in new contexts. However, the study focused on a small group of students for only a short period of time. Further studies need to look at the effectiveness of mobile learning within different courses and over a longer period of time.

In addition to improving the vocabulary acquisition process, 10 students in the experimental group were asked to answer the questionnaire after they had finished a two lesson study. A five-point scale ranging from "strongly disagree" to "strongly agree" was used. The results are presented in Table 2 below.

Table 2. Responses from student questionnaires.

	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Interacting with Kahoot helped me remember my English vocabulary better.	40%	10%	20%	10%	20%
2	I enjoyed learning vocabulary through Kahoot more than the methods I used in the past.	40%	0%	0%	30%	30%
3	The app had a positive effect on my study behaviour.	0%	30%	40%	20%	10%
4	Playing Kahoot motivates me to learn new words.	10%	0%	60%	30%	0%
5	I appreciated corrective feedback of the app.	0%	30%	70%	0%	0%
6	Using Kahoot to test my vocabulary knowledge was funnier and less stressful.	0%	0%	60%	20%	20%
7	I prefer working in couples or groups better than alone.	10%	30%	20%	10%	30%
8	I woul like the app to be implemented in future lessons.	10%	20%	20%	20%	30%

Students from the experimental group provided their opinions on the implementation of the Kahoot application in English as a foreign language vocabulary learning, and 60% of them agreed that learning vocabulary through Kahoot was more enjoyable than other traditional methods used in the past. From the process of learning and its observation, it was evident that students felt more motivated and became active learners in a competition environment setting. The study dealing with a similar topic conducted by Pede [30] revealed that 100% of participants indicated that they enjoyed using KAHOOT in the class, and 67% of participants stated that they preferred to use technology over traditional methods of instruction, which is comparable to our findings. Furthermore, Table 2 shows that 40% of students from this study stated that using Kahoot to test their vocabulary knowledge was more fun and less stressful for them. The same percentage of participants appreciated the possibility to work in couples, which they preferred more than working alone. This fact was notable during the process of vocabulary learning, as the students worked in couples and looked more comfortable and confident after discussing their ideas with peers. It can be said that using the mobile application helped students develop their collaboration competencies and had a positive effect on the students' learning behaviors. Additionally, Item 8 illustrates that 50% of the participants would like the app to be implemented in future lessons. Pede [30] found that 85% of participants would like to share Kahoot with their friends and other students.

Student responses in the questionnaire revealed a diverse amount of information on the use of the mobile learning application in the process of vocabulary acquisition. Most of the participants were satisfied with its use, while some others shared a contrasting opinion. What was unexpected was the fact that 70% of students did not know whether they appreciated the corrective feedback of the app, and 60% of them stayed neutral when it came to the evaluation of motivation leading to the acquisition of new words. In contrast to the current study, the research conducted by Wang and Suwanthep [21] expressed that the vocabulary learning application motivated 80% of the participants to learn new words.

The results of this study reveal that the use of the Kahoot application has a positive impact on students' achievement results as far as vocabulary learning is concerned. This is in line with the findings of other research studies, such as those of Klimova [15], Rezaei et al. [16], Mahdi [17], or Wu [18], all mentioned above.

The results of the questionnaire also showed that using the Kahoot application was more enjoyable and fun for students than the traditional teaching methods. This was also confirmed by Davie and Hilber [19] or Wand and Suwanthep [21].

The app also contributed to collaborative learning, which is in line with the principles of constructivism described in the Literature Review section above.

The only drawbacks of the use of the mobile app included students' dissatisfaction with the corrective feedback and a lack of motivation to retain new words via the mobile app.

5. Conclusions

Every generation of students has its own characteristics affected by the time period they grew up in. Researchers agree [1,5,6] that it is important to create learning environments that meet the

learning needs and preferences of a specific generation to make the learning process more productive. Regarding the fact that the students of Generation Z (who use their personal devices on a daily basis) are now attending schools, teachers need to update traditional methods of teaching and make the learning environment more appropriate to modern students, such as using mobile technology in the process of learning. Different studies on using mobile applications in the process of vocabulary acquisition were conducted. On the basis of their results and the results of the current preliminary study, it might be concluded that the use of mobile devices in EFL classes is effective in improving student vocabulary knowledge. At the same time, the results indicate that being a Generation Z student does not make him/her automatically interested in using mobile applications in the process of language acquisition. There is still a noticeable number of students who prefer learning languages through traditional methods.

Since this was a preliminary study, future research will involve larger sample subject sizes, which would confirm the findings of this preliminary study as well as reveal further characteristics of Generation Z students when using mobile apps in learning.

The limitations of this study were the small subject sample and a short intervention period. In addition, the students in the control group were disadvantaged because they did not have as many opportunities for exposure to the target language, which meant the extra practice time may have played a role in achieving better scores by the students in the experimental group. Despite similar findings from various studies [11,15,21], which agree on the usefulness of the mobile application in the process of vocabulary acquisition, further research is needed to validate the findings of these investigations because of the small research sample. Furthermore, both groups should get the same amount of exposure or practice time to ensure the reliability and the validity of research findings.

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