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Vocabulary Learning through a Gamified Question and Answer Application

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ABSTRACT

Learning German as a second foreign language is the most selected second language among public and private schools in Turkey. Among the components in learning the German language, vocabulary is one of most difficult and important component. The purpose of this study is to investigate the effect of using a gamified application, on German vocabulary to Turkish students learning German as a second foreign language. The Quiz Game, a gamified question and answer tool, was implied to participants by the researcher. Totally,31 3th grade students participated in this study. During 8-week treatment, the students practiced the Quiz Game application in 20 minutes periods. Qualitative data include interviews and personal motivational inventory that were collected for each participant to determine how participants perceived their experience with this game. Quantitative data for each participant, including pre-tests and post-tests were collected to examine participants' progress in word recognition and the impact of games on the students' use of vocabulary learning strategies. The findings show that with the help of this gamified practice tool the 97% of the learners are more eager to learn German especially vocabulary and a significant difference between pre-and-post test scores of the students' vocabulary knowledge was found ($t(30)=-9.12$, $p<.01$). It is clear from the interview answers that participants wrote most of them have positive attitudes and adjectives towards to the Quiz Game application. This study may have recommendations to be taken for consideration for further research; younger learners and elder learners may be conducted to enlarge the findings.

Keywords: *vocabulary learning, gamification, german vocabulary, gamified, digital game based learning*

INTRODUCTION

It is important to record down that while teaching foreign language learners` needs, can differ widely and that is why, there should be integrated different instructions, methods, models etc. in the classroom based on learners` needs.

Anyaegbu (2010) believed that our learners are changing rapidly; most of them find classroom activities boring and finally they lose their interest during learning process. Since the educational system no longer meets the demands of our society, Shaw (as cited in Bromley, 2007) proposed that teachers should always search for new ways to connect with future learners while teaching new vocabulary.

According to the study of Huyen et al. (2013),it is obvious that during the learning and teaching of vocabulary, games have got a crucial role. To show this, I selected to do a research on this topic. It is also important for the educator to choose suitable games according to the objectives, the number of learners, proficiency level, cultural context, timing and classroom settings.

The purpose of this study was to investigate German students' perceptions, ideas on the motivation and vocabulary performance of using a gamified application for German learning in a private school, in Turkey. To investigate the purpose of the study data has been done by pre-test, post-test, open-ended questionnaire and a motivation inventory. Through the pre-test–post-test method, it has been investigated the development of the students after playing QuizGame question and answer tool in their lessons. Open-ended questionnaire has been applied to derive the thoughts and experiences of the participants about the Quiz Game application and learning through Quiz Game application. Also, the motivation inventory provided detailed data about participants'' motivation, opinions and assessment.

In this study following research question was posed;

1. Does gamified question and answer application have an effect on students' vocabulary test scores?
2. What is the students' intrinsic motivation level after using gamified question and answer application?
3. What are students' thoughts towards the use of gamified question and answer application in German classes?

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LITERATURE REVIEW

This chapter reviews literature related to learning vocabulary and more specifically, learning vocabulary through the use of digital games. The first section addresses second language learning. The second section focuses on the use vocabulary learning and second language vocabulary learning. The third section includes using computer games in language learning and second language learning. The last section reviews game based learning in assisting learners acquire the vocabulary of a second language.

SECOND LANGUAGE LEARNING

The process of learning a second language is an extremely complex process. As this process involves several rules, facts, complexity etc., it can be common to seen second language learners struggling or having hard time with expressing an idea in the target language. There have been several theories, factors, frameworks and researches regarding second language learning. As Bahrani et al. (2014) stated that Gass, Selinker, Eliis and Krashen introduced several hypotheses for second language learning. Below would be these theories and researches discussed.

Bahrani et al. (2014) discuss Krashen's input hypothesis which argues that in order for second language learning (SLA) to take place, the learner must be exposed to second language data, or vocabulary, that they can comprehend. Furthermore, according to Krashen,(Bahrani et al. 2014) the effectiveness in learning a second language is rooted in the access the learner has to second language vocabulary. Bahrani et al. (2014) go on to state that the greater quantity a learner has of the second language vocabulary, the greater and faster the SLA takes place.

It must be noted the criticism that Krashen's input theory has not gone unchallenged (Bahrani et al. 2014).Fellow researchers in the field agree with Krashen that exposure to second language vocabulary plays an important role in SLA, however, there are more variables that must be recognized and understood (Bahrani et al. 2014).Bahrani et al. (2014) detail McLaughlin's (1987) work where the differing levels of second language proficiency in students is a very difficult variable to measure. As a result, finding the appropriate language input, second language vocabulary for a classroom becomes a challenging task. Krashen did not offer a solution to this problem (Bahrani et al. 2014).

Feng (2009) stated that during second language development, proceduralization of the declarative knowledge, automaticity in language skills, practice and skill development is important. Woolfolk (as cited in Feng, 2009) stated that when a learner receives explicit instruction while playing the piano, such knowledge tends to be declarative, which means it can be assimilated and verbally repeated. But, this step does not mean that learner can play the piano smoothly, as Feng (2009) suggested that to make a good performance learner should transform his/her declarative knowledge into procedural knowledge; this process is defined as proceduralization. This view can also be used to look at the SLA process. Feng (2009) supports the assertion that a learner simply knowing the rules of the target language does not mean that the learners can use the language correctly and fluently. This helps to support the argument that the whole process proceduralization is an important element. Feng (2009) emphasized that the more vocabulary and rules are practiced, the more automatic they become, meaning that learners can repeat the use of the target language. This results in the proceduralization and automaticity stages to be realized. During the learning process, to have effective practice in the classroom and thereby achieve the desired outcome, teachers may use several tools to take the learners' attraction; such as games, computer games etc.

Feng (2009) stated that practice is playing an important role during language learning, especially when the target language is drastically different from the learners' native language. Repeating and practicing whole output and input steps may be useful for learners. Feng (2009) suggested that with practicing; linguistic rules would be strengthened and the degree of automaticity would be increased. It is important for educators to not lose sight of this obvious but vital role in SLA.

Dornyei and Ushioda (2009) outlines a connection between the students perceptions of why they succeed or failure in learning an aspect of a second language. If a student perceives their performance in learning a second language to the difficulty of language or to their capability, their motivation is lower because they view these factors as unchangeable. Conversely, if a student views their successes and failures due to their personal effort, they have higher levels of motivation because this is a factor that is under their control and can be changed (Dornyei et al. 2009).

VOCABULARY LEARNING

Vocabulary learning is one of the major elements of language learning process. Learners who have more knowledge of vocabulary are more proficient in language skills (Bakar & Nosratirad, 2013).Furthermore, Bakar and Nosratirad (2013) added that vocabulary is the extended part of one's knowledge of the meaning of words. An essential element of language learning is building one's personal store of

words and expressions, a necessary component to improving competency in all areas of communication (Godwin-Jones 2010).

An interest in vocabulary teaching was rekindled in the 1980s after several decades of neglect in part during the years of Audiolingualism in language teaching, where the focus was on restricted pattern learning, and subsequently Chomskian linguistics, which prioritized syntax (Jasso 2012).Slowly, vocabulary teaching started to gain importance. One impetus that pushed the teaching of vocabulary was the increase in the number of and access to frequency word lists, which outlined the most frequently used and therefore most necessary words for learners and teachers (Jasso 2012).

Frederick (2010) pointed out that to set the foundation for further success, students would have to obtain a rich knowledge of the vocabulary in the target language, otherwise students may be unprepared for an academic world. Frederick (2010) expressed that there are two strategies to increase vocabulary knowledge: one is incidental learning, which includes word knowledge as a result of reading, and direct instruction, the other is intentional learning, which is teaching the words more systematic way.

There are different types of words, such as; verbs, nouns, pronouns and Vahdat and Bahbahani (2013) stated that classification of words is important because these different types of words require different instructional processes. As many students may perceive the learning process boring, teachers should instruct the vocabulary teaching process and strategies well to keep the level of interest in the students towards their new language high. Besides technological tools; such as computer, tablets and digital portals, Frederick (2010) asserted that schools, teachers and educators should engage students to word process. A possible solution could be using digital games during vocabulary learning. According to the findings of Bakar and Nosratirad (2013), computer games can be utilized as a learning tool with enough practice, clear objectives and consistent playing to learn new vocabulary.

Shaw (2010) postulated that games might have been a factor in acquiring and retaining vocabulary, he added that the use of games would be an enjoyable and motivating way to engage students and increase their desire to develop their vocabulary knowledge. Besides, the trend of vocabulary learning through gaming could be strengthened by adding options to both sections of game and learning via combining game with electronic and computing tools (Vardanjani, 2014).

COMPUTER GAMES AND LANGUAGE LEARNING

It is not a debatable opinion to state that technology has changed the world and is continuing to do so. It is nearly impossible to live in the modern era without being exposed to computers in some facet, and this is even more pronounced in the younger generation that does not know a world without computers.

As has been already detailed in this review, learning a foreign language may sometimes be frustrating because of the amount of time and effort the learner must. According to Feng (2009) computer games may help in addressing these efforts; his study's qualitative and quantitative data results' showed that computer games helped a lot during language development as games are motivating and engaging the learners to the learning process. This claim is further supported through the study done by Dickey (2011) who found that subjects found intrinsic motivation through playing the game Murder on Grimm Isle. In the same study, most subjects told Dickey that they did not like writing papers, however they found the game enjoyable. This goes to show the motivational power of games versus more traditional methods of teaching a second language.

Language learning process may be much more enjoyable with games. Muhanna (2012) pointed out that as games are challenging and amusing; well-chosen games will allow learners to practice their language skills and give opportunity to have a break; also games will encourage and increase the cooperation between students. The results of Muhanna's (2012) study suggested that with the help of games students will have much more fun during practicing and reviewing of language lessons, improve their communicative skill, additionally students will search for new way of learning about subjects as well.

Using digital games for education may have several benefits. According to Feng's (2009) study, when used appropriately and frequently computer games may be a good self-study tool. They allow the student to practice the target language in an enjoyable environment, as well as on their own time. Feng (2009) continues to state that the games would enable learners to develop their automaticity in their L2.

The notion of a 'safe learning environment' or a more anonymous learning environment was further supported by Rama et al. (2012).World of Warcraft was the MMORPG that was studied, and at the end it was found that the game provided three overall positive factors to students;

1. Allows for and creates a safe learning and language space.

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2. Emphasizes communicative competence, or the ability to communicate meaningfully and effectively within a given context.
3. Promotes goal-directed, collaborative action between experts (native or fluent speakers) and novices.
4. In contrast to the style of game studied by Dixon, Miller and Hegelheimer (2006) looked at The SIMS, which does not have players conversing with other real players in real time. Despite the difference, the study found that the subjects found the game to be highly appealing (Miller et al. 2006).It must be noted as well that the duration of Miller et al. (2006)'s study was a mere three days. Even though the study took place over a short amount of time, almost all of the students felt that they learned something from the game and improved their grammar (Miller et al. 2006).It is not unreasonable to hypothesize that when the game is used for a longer period of time, the results could be even more encouraging.

Another interesting result in the use of computer games as a language learning tool is how the students become involved in the game. That is to say, they begin to build an attachment with the characters in the game (Feng 2009).This was noted specifically in the game The Sims 2. One of the subjects noted that they really enjoyed playing the game because it was "close to real life" and they were therefore able to "taste the fun of life" through the game (Feng, 2009).

Chen and Yang's (2012) study looked at the effectiveness as well as the perceptions of the students who played the game BONE. When analyzing the students perceptions of their experience playing the game, they found that the challenging nature of the game proved to be a motivating factor for students (Chen et al. 2012). However, students also mentioned that if some activities in the game were too challenging, they became frustrated and lost interest. This is an important distinction that educators should be aware of.Educators must know their students abilities as this study shows that it is a very fine line between the degree of difficulty.On one hand, the students must be challenged in order to continue to improve their L2, but they also must not be challenged to the degree that the find the exercise too frustrating and end up losing their motivation.

The study also discussed the learners favorable perceptions about the music and graphics in the game (Chen et al. 2012).While this may seem to be a minor point, anything that the users of the game deem to be positive should be taken into account when producing these games. Any chance to potentially maximize a game's ability to sustain or increase the students' motivation towards their SLA process should be taken seriously. Another complaint from the learners was the speed at which the dialogue in the game was spoken (Chen et al. 2012).

Their study showed that there is a significant difference between traditional and digital methods in expanding students' vocabulary knowledge. Computer games may provide an alternative, entertaining way to the routine teaching process. As demonstrated in previous studies, computer games can prove to be a strong motivating factor. The lack of the stated motivation can be a devasting hurdle to overcome for the SLA process, a hurdle that computer games can potentially help tool essen. According to Vardanjani's (2014) study, learning vocabulary through games will foster students' cognitive skills, emotional consequences and interactive consequences. Using computer games may have positive effects, but teachers should have specific guidelines to integrate these games into their curriculum. Miller and Hegelheimer (2006) stated that teachers should determine which games to use and how to be used according to the needs of their students.

GAME BASED LEARNING

In the past two decades, computer games have become more and more common in our daily lives (Vardanjani, 2014).As such, it would be beneficial to educators to continue exploring the potential uses of games in the classroom for the purposes of teaching a second language. Also, students who want to learn a language individually could possibly gain from using games either in conjunction with traditional methods, in complete replacement of them. Vardanjani (2014) defines a game as an amusing and enigmatic exercise that people of all ages perform in various forms of interactive, adventure, puzzle, fighting, sports, and role playing.

Stephenson and Rumley (2005) detail how games can be a useful tool in promoting interest and motivation in the learner as they can be fun and engaging. They go on to claim that the meaningful context that the language is provided in to the learner has the ability to help the learner retrieve the words needed from memory, thus assisting the leaner gain automacy of their L2. All these factors lend themselves to the idea that games can be a very useful in the SLA process.

In their study using Handheld English Language Learning Organization (HELLO), Liu and Chu (2010) concluded that the participants in the study outperformed the participants who did not use the gaming-method of learning. The study attempted to measure four factors in the learning process; attention,

relevance, confidence and satisfaction (Liu et al. 2010).At the end of the study, the group that used games had higher scores in every field, further strengthing the claim that has been made before between the use of games and increased motivation.

Even when students are aware of the importance of learning vocabulary, most students learn vocabulary in a passive manner (Huyen & Nga, 2013). In this case, passive learning is used to describe the student simply listening to the teacher explain what a word means rather than actively discovering the mean themselves. Huyen et al. (2013) also state that many students they encountered in their study were reluctant to use the new vocabulary even though they claimed to know the meaning of the word. In the study, rather simple games such as 'Hangman' were used, among others and Huyen et al. (2013) discovered that the students were more involved in the learning process.Teachers of the students who were interviewed for the study stated that the students seemed to learn new vocabulary more quickly and students commented that they felt they could learn new vocabulary more quickly when learned through games (Huyen et al., 2013).It must be noted that these results are based on the opinions of the students and as such must be observed critically, however, the students view that they learn more quickly through games is a positive indicator of the effect games have on the students' attitude towards their L2.

GAMIFICATION IN EDUCATION

There are several technological tools such as mobile devices to use during language teaching: Cell phones, personal digital assistants (PDAs), smartphones and tablets etc. Huyen and Nga (2013) claimed that in vocabulary classes educators should use games as they are useful and effective tools, because the combination of words with games will make the lessons more interesting, enjoyable and effective. Game Based Learning may eliminate this unnecessary stimulus from the game, which increases the contact the learner has with useful vocabulary, enhancing the likelihood of success in the learners SLA process.

Zichermann (2012 as cited by Abrams et al., 2014) discusses 'Gamification' which can be defined as "using game thinking and game mechanics to engage audiences and solve problems". An important aspect of gamification is real time feedback, which helps the learner build on their critical thinking (Lee and Harper, 2011 as cited by Abrams et al., 2014). This is still a very new field of study which results in there being little statistically significant data about gamified vocabulary learning. Despite the absence of rich data on gamified technology, one big theme that reoccurred in Abram's et al. (2014) review of the available material is the positive effect of real time feedback. This potentially can be viewed as a parallel between the immediate feedback one would experience when actually using language in the real world. That is to suggest that when using language in a day to day setting, the speaker is constantly receiving input, in the form of written or spoken language, and must immediately react by using their language skills to respond. This transaction of language can be seen to be loosely mimicked through gamified vocabulary learning. Abrams et al. (2014) continue by stating that modern education should occur both in and out of the classroom. This will allow the SLA process to become more student-driven as they can learn vocabulary in a classroom setting by reacting to what their needs are in a real life setting.

Yet, whether it is a game, multimedia element or a web technology, one of the most important parts of an educational renovation is a good pedagogy.

METHODOLOGY

In this chapter, the instruments of methodology will be introduced in terms of research design, setting, participants and procedure, data collection instruments, procedures and data collection. To carry out this particular mixed method study, it has been traded upon both qualitative methods and quantitative methods to investigate the impact of using digital games in German language classes and derive the thoughts and experiences of the German language learners about playing digital games while learning German language.

Research Design

This study has been carried out to answer the research question "The purpose of this study was to investigate German students' perceptions, ideas on the motivation and vocabulary performance of using a gamified application for German learning in a private school, in Turkey. To investigate this, a survey has been conducted with young German language learners in a private school in Istanbul. To make the results clear only one game, which is called QuizGame, have been played by the participants during their German language lessons. The survey has been conducted during the spring term of 2016-2017 academic years. The sample group has been chosen from 3rd grade students who are taking German language course as a second language. They have already been taking German language lessons for one to three years. Participants have been selected from different language levels to observe the progress of students from all levels. The participants consist of thirty-one students at the age of eight and nine. To investigate the difference of thoughts between female and male students, eighteen of the participants are female and thirteen of the participants are male.

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Procedures

To investigate the effect of the game, participants have been asked to complete a pre-test of 25 questions abouparts of a house and clothes. Through the results of the pre-test the level of the students has been identified. After the test participants have played QuizGame about parts of a house and clothes in their lesson to find out the effect of the game on their learning these particular subjects. During 16 lessons participants have played QuizGame. They played QuizGame for 20 minutes in each lesson with other participants in the classroom. After 320 minutes QuizGame playing participants have done the same test again as a post-test of the survey. To find out the thoughts of participants and find the answer of the research question they also have asked to answer an open-ended questionnaire to share their thoughts and experiences. Morover, they have also been asked to fill in a motivation inventory to find out their attitudes towards playing digital games in German Language classes and have detailed information about their experiences of playing Quiz Game.

For this study data has been collected from thirty one third grade students of a private school. To investigate the effect of the game they have been asked to complete a pre-test before using Quiz Game in their lessons. After that they have been asked to take the same test as a post-test to compare the results of these two test to figure out the effect of the gamified application on the students. Then they have been asked to answer an open-ended questionnaire and a motivation inventory.

Data Collection Procedures

To accomplish the aim of this study data has been collected in three ways: testing to investigate the effect of the Quiz Game, open-ended questionnaire to collect participants' ideas and motivation inventory to figure out the personal approaches of participants to the Quiz Game. All the ways have been used in this study are expounded below.

Testing

Testing is an important way to see the development of the participants. In this study students are given two tests to find out the difference after applying the Quiz Game application. In order to find clear evidences for the survey students asked 25 questions before applying the application and then they have also been asked to do the same test after they play Quiz Game in their lessons. Before applying Quiz Game to the students they have been asked to take a multiple choice test. There were twenty-five questions in the test that participants took. The questions were about parts of house and clothes. There were questions, which examined the parts of a house and clothes vocabulary knowledge of the participants. All of the questions and choices were written in German language. There were also questions about articles of the words and plural forms of words.
As a post-test, the same test have been applied to the students after learning clothes and parts of a house vocabulary by Quiz Game for twenty minutes each lesson during sixteen lessons. The questions were the same, yet the choices were placed in a different order.

Open Ended Questionnaire

In order to collect the ideas of the participants they have been asked to answer an interview. This interview consists of six questions and participants are asked to write their opinions on paper. Questions of this interview are related to the Quiz Game in terms of the experiences of the participants. All questions require short and clear answers. In three of the questions, participants are expected to write "yes or no" as an answer. On the other hand, for the other three questions participants are asked to write their opinions and thoughts about the game in a short way.
The questions have been asked to the participants as the interview are shown below:
Do you play games? Which games do you play?
Did you have fun when you were playing QuizGame application?
What do you think about QuizGame application? Can you share your ideas?
Were there anything that you found difficult? Can you share it?
Do you think that you develop yourself by QuizGame application in German language lessons?
How is that to learn German language in this way?
As it can be seen above, the questions are mostly about understanding the students' experience on gamified application.

Motivation Inventory

In order to find the effects of the Quiz Game questıon and answer application to answer the research question participants are asked to fill in a motivation inventory at the end of the study. There are thirty-two general questions about doing something but participants gave their answers considering the Quiz Game application and their experiences during the survey. Answers have been given on a 1 to 7 scale. Participants chose 1 to say that they were not agree and they chose 7 to say they were agree. The questions of this inventory are appropriate to figure out how the participants feel when they were using the application.

This intrinsic motivation inventory has been evaluated in terms of linguistic equivalence, reliability and validty by Caliskur and Demirhan (2013) in their study Intrinsic

Motivation Inventory Linguistic Equivalence, Reliability and Validity Study. After carrying out the validity reliability study of this inventory it is needed to do question ordering and removing changes on the original question sequence, therefore new question numbers are valid on scoring. The differences has been seen when the original English inventory analysed caused by this situation. The changes are: in the subscale of pressure/tension Q20 (original)=19 (new), Q21=20, Q22=21, Q23=22; in the subscale of perceived choice Q25=23, Q26=24, Q28=26, Q29=27; in the subscale of value/usefulness Q27=25, Q30=28, Q31=29, Q32=30, Q33=31, Q34=32.The score calculation is as the value of the score for the direct statements of the inventory (i.e. if it is 1 the score will be 1, if it is 7, it will be 7).On the other hand the statements 3, 4, 13, 15, 18, 20, 23, 24, 26 on the inventory are reverse, so the scores of these statements are converted a new score by subtracting from 8. In accordance with the subscales presented in the article, by analysing the group average of every subscale, the scores have been evaluated as under the average and above the average, that is to say group norm of every subscale have been calculated separately in thier own rights, there is not a total score calculation of this inventory except this.

Data Analysis Procedures

To complete the survey data has been collected by three main ways, which are vocabulary test, open-ended questionnaire and motivation inventory. In order to find the answer of the research question all these inventories have been investigated deeply. By investigating, the pre-test and the post-test the research question have been studied. The results of pre-test and posttest have been compared to find out the effect of the Quiz Game application. The answers given by the participants have been noted down for both the pre-test and the post-test so as to observe the correct and incorrect answers. Descriptive statistics, mean scores, standard deviation and comparison tests were made to analyze the data.

The answers of the participants to the open-ended questionnaire have also been analyzed deeply. The answers have been separated into groups by questions as positive answers and negative answers for the questions required 'yes' or 'no' answer. Besides the questions, required detailed answers to find out their experiences and thoughts have been studied.
To see the motivation of the participants about the Quiz Game the motivation inventory has been investigated. According to the answers of the participants, their thoughts and opinions have been analyzed to figure out the effect of Quiz Game application in terms of their German language learning process.

Trustworthiness

This study has been carried out with the students age of 8 and 9, so considering their age they have the tendency of sharing their thoughts freely without thinking the results. This is an advantage for this study to have the fair thoughts about playing Quiz Game in the lesson. On the other hand pre-test and post-test have the same questions hence there are no difficulty difference between these two test in order to see the effect and the development after practicing with the game. The data which has been derived from the open-ended questionnaire and the motivation inventory have been analyzed deeply to find out clear result for the research question.

RESULTS

This chapter includes the deep investigation of the data, which has been collected from the participants who are third grade students of a private school in Istanbul during the survey. The data has been studied in terms of the research question below:

**What are the thoughts of German language learners towards the use of digital games in German Language classes?*

The Findings of Research Question

To find out the answer of the research question the results of the pre-test, the post-test, the open-ended questionnaire and the motivation inventory have been studied below in detail.

The Findings of Research Question 1: Does gamified question and answer application have an effect on students' vocabulary test scores?

Using pre-test and posttest is useful to see the development on a particular area after a progress. This method has been applied for this study to see the difference clearly, after the participants play Quiz Game to learn the clothes and parts of a house vocabulary in German language.

Pre-test has been applied before the students play Quiz Game and post-test has been applied after 320 minutes Quiz Game playing in order to investigate the effect of Quiz Game application. To make the results reliable and fair the questions have been asked were the same for the pre-test and the post-test. The answers have been collected before and after the using of Quiz Game to see the difference between the answers. The answers of the participants for the pre-test and the post-test are given below in Table 1.

Table 1. Mean Scores of the tests

	X	N	S	Std. Error Mean
Pre-test	12.3871	31	4.01395	.72093
Post-test	17.6774	31	2.62535	.47153

As it is seen in this Table 1, mean scores of the students increased after the procedure. In order to understand if the difference is meaningful paired sample t-test results of the pre and post test scores are presented below.

When Table 2 is examined, there is a significant difference between pre and post test scores of the students ($t(30)=-9.12$, $p<.01$). The students' vocabulary knowledge was X=12 before the application, and after the gamified application their vocabulary knowledge was found X=17.

Table 2. The paired sample t-test results of the pre and post test scores

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pre-test - Post-test	-5.29032	3.22690	.57957	-6.47396	-4.10668	-9.128	30	.000

The Findings of Research Question 2: What is the students' intrinsic motivation level after using gamified question and answer application?

The results of the motivation inventory, which has been filled in by the participants, are given in Table 3. The numbers given shows the number of students who chose this particular answer.

Tablo 3. The results of the motivation inventory

			Less concrete					*more concrete*	
	Questions		**1**	**2**	**3**	**4**	**5**	**6**	**7**
1	I liked this.	f	0	0	0	2	0	5	23
		%				%6,66		%16,6	%76,6
2	It was so funny.	f	1	0	0	2	4	3	20
		%	%3,33			%6,66	%13,33	%10	%66,66
3	I thought that it was boring.	f	23	4	0	2	0	0	1
		%	%76,66	%13,33		%6,66			%3,33
4	I was not interested in this.	f	24	4	0	2	0	0	0
		%	%80	%13,33		%6,66			
5	I thought it was very interesting.	f	0	1	3	5	0	5	16
		%		%3,33	%10	%16,66		%16,66	%53,33
6	I think this is pretty enjoyable.	f	0	0	1	2	2	8	17
		%			%3,33	%6,66	%6,66	%26,66	%56,66
7	I enjoyed while doing this.	f	0	0	0	1	0	9	20
		%				%3,33		%30	%66,66
8	I think that I am good at it.	f	0	0	0	4	0	10	17
		%				%13,33		%33,33	%56,66
9	Comparing with others I think I am really good at it.	f	4	0	0	2	1	11	12
		%	%13,33			%6,66	%3,33	%36,66	%40
10	After working for a while I felt that I am pretty sufficient for this.	f	3	0	0	3	0	12	12
		%	%10			%10		%40	%40
11	I am pleased with my performance on this.	f	0	0	0	1	1	9	19
		%				%3,33	%3,33	%30	%63,33
12	I am very ingenious to do it.	f	0	0	0	6	0	10	14
		%				%20		%33,33	%46,66
13	This is something that I can not do well.	f	10	9	1	2	0	3	5
		%	%33,33	%30	%3,33	%6,66		%10	%16,66
14	I made too much effort for this.	f	4	0	0	1	0	10	15
		%	%13,33			%3,33		%33,33	%50

15	I did not make too much effort for this.	f	14	10	1	2	0	0	3
		%	%46,66	%33,33	%3,33	%6,66			%10
16	I struggled a lot for this.	f	5	0	1	1	1	8	14
		%	%16,66		%3,3	%3,33	%3,33	%26,66	%46,66
17	It was important for me to do this.	f	0	0	1	1	2	9	17
		%			%3,33	%3,33	%6,66	%30	%56,66
18	I did not waste too much energy for doing it.	f	18	7	1	1	0	1	2
		%	%60	%23,33	%3,33	%3,33		%3,33	%6,66
19	I was so nervous while I was doing it.	f	22	7	0	1	0	0	0
		%	%73,33	%23,33		%3,33			
20	I was so relaxed while I was doing it.	f	0	0	0	6	0	9	15
		%				%20		%30	%50
21	I was worried while I was working on it.	f	20	7	0	2	1	0	0
		%	%66,66	%23,33		%6,66	%3,33		
22	I felt under pressure while I was doing it.	f	19	9	0	2	0	0	0
		%	%63,33	%30		%6,66			
23	I felt that it was not my choosing doing this.	f	20	9	0	1	0	0	0
		%	%66,66	%30		%3,33			
24	Actually, I did not have the chance to choose doing this or not.	f	16	9	2	0	0	2	1
		%	%53,33	%30	%6,66			%6,66	%3,33
25	I felt that I should do this.	f	3	1	0	5	2	9	10
		%	%10	%3,33		%16,66	%6,66	%30	%33,33
26	I chose this because I did not have any other options.	f	16	8	0	2	0	4	0
		%	%53,33	%26,66		%6,66		%13,33	
27	I chose it, because I want to choose it.	f	2	0	1	1	1	15	10
		%	%6,66		%3,33	%3,33	%3,33	%50	%33,33
28	I did it because I had to do it.	f	4	1	3	2	1	14	5
		%	%13,33	%3,33	%10	%6,66	%3,33	%46,66	%16,66
29	I believe that this may be very useful for me.	f	0	0	0	1	0	12	17
		%				%3,33		%40	%56,66
30	I want to do this again because it develops me.	f	0	0	0	1	0	11	18
		%				%3,33		%36,66	%60
31	I believe that it may be beneficial for me.	f	0	0	0	2	0	11	17
		%				%6,66		%36,66	%56,66
32	I think that it is an important activity.	f	0	0	0	1	0	13	16
		%				%3,33		%43,33	%53,33

The most popular answers are 6-7 and 1-2 according to the Table 3. According to the data which has been taken from the participants as we see above %94 of the participants highly liked Quiz Game application. 77 percent of the students think that Quiz Game is funny. Only one student thinks the game is boring. %97 of the students enjoyed while they were playing Quiz Game. 94 percent of the participants are pleased with their performance on Quiz Game. For %94 of the students it was important to do Quiz Game. %97 of the students did not feel nervous while they were playing Quiz Game. For 97 percent of the students playing Quiz Game may be very useful for them. %97 of the participants want to play Quiz Game again because it develops them. 97 percent of the students think that playing Quiz Game is an important activity.

What are students' thoughts towards the use of gamified question and answer application in German classes?

The findings of the questionnaire questions are discussed below:

Question 1: Do you play games? Which games do you play?

All participants answered "yes" for the first part of the question. %69 (22 students) of the participants said that they play online games and computer games. Only 31 (9 students) percent of the students wrote that they play street games or toy games.

Question 2: Did you have fun when you were playing QuizGame application?

%97 (30 students) of the students found the Quiz Game application enjoyable. Only one student gave a negative answer for this question. Here is the answer: "*No, I did not have fun. But the pictures of the game were too pretty*." As we can see from this answer even a participant who does not like the game can find something attractive about the game.

Question 3: What do you think about QuizGame application? Can you share your ideas?

Answers of some of the participants:

"*It is a good game. I learn German language while I am playing. When I make mistakes I learn the correct answers."*
"I think it is very good. It is both educational and instructional."
"Quiz Game is a good application to learn German language."

Thirty of the students have positive thoughts about Quiz Game application. They think that it is funny, enjoyable, educational, and exciting. Only one student identified the game as "weird".

Question 4: Were there anything that you found difficult? Can you share it?

%26 of the students had no difficulties while they were playing Quiz Game application. 52 percent of the students wrote that the questions were hard for them. %22 of the students had some various difficulties such as creating groups, some parts of the game.

Question 5: Do you think that you develop yourself by QuizGame application in German language lessons?

Only one participant answered this question negatively. %97 of the participants thinks that they develop themselves by Quiz Game application.

Question 6: How is that to learn German language in this way?

All the participants have positive thoughts about this question. They think that learnin German language via Quiz Game application is good and enjoyable. Here are some answers of the participants about the question:

"It is good and enjoyable."
"Difficult and so good."
"It is good because we are playing with our tablet pcs."

Discussion and Conclusions

To investigate the purpose of the study data has been collected by pre-test, post-test, open-ended questionnaire and a motivation inventory. Through the pre-test–post-test method, it has been investigated the development of the students after playing QuizGame question and answer tool in their lessons. Open-ended questionnaire has been applied to derive the thoughts and experiences of the participants about the Quiz Game application and learning through Quiz Game application. Also the motivation inventory provided detailed data about participants'' motivation, opinions and assessment.

Discussion of findings of RQ 1: Does gamified question and answer application have an effect on students' vocabulary test scores?

In order to find an answer to this question students' test results have been analysed deeply. According to the results of the testing it is obvious that playing Quiz Game developed the learners' vocabulary skills on the subjects of clothing and parts of a house. There is a significant difference between pre-and-post test scores of the students' vocabulary knowledge. According to the results, playing digital games in classroom while learning German language have a positive effect on the development of students. Most of the students did more correct answers in the second test that they took after playing Quiz Game in their lessons. The students' mean scores were increased significantly, as they had more correct answers, and it is considerable effect of playing digital question and answer application in German language classes. As there is no control group of students, it may not be possible to comment on what would happen if they did not use the question and answer tool. Therefore, the generalization of the findings are limited in this

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scope. Another group of students who are not using the question and answer tool is required to compare the vocabulary scores.

Discussion of findings of RQ 2: What is the students' intrinsic motivation level after using gamified question and answer application?

In accordance with the analyzed results of the motivation inventory, which has been filled in by the participants after playing Quiz Game in their lessons, the participants are highly motivated to play digital question and answer games in their German language lessons. Most of them have positive thoughts about learning German language through playing digital games. Being liked and enjoyable makes the digital games useful and appropriate to teach a foreign language to young learners. Feeling nervous effects learning progress, however students did not feel nervous while they were learning via Quiz Game application. Nearly all of the participants want to play Quiz Game again for as much as they think that the game develops their German language skills.

Discussion of findings of RQ 3: What are students' thoughts towards the use of gamified question and answer application in German classes?

Through the data has been derived from open-ended questionnaire shows positive attitudes towards playing digital games in German language lessons. According to the results all participants play games and most of the usually play digital games via their tablet pcs and computers. This is an advantage to teach through games to these students by reason of they like and enjoy playing games. The participants have positive thoughts about playing digital games while they are learning German language. According to the answers, which are given by the participants the most attractive thing about digital games, is that the game is like a competition and they want to win or have degrees on the game, also they like being good at among their friends. Moreover, the students think that they may lose but they also learn from their mistakes while playing Quiz Game. This is a considerable point while teaching a language. As it is known mistakes usually frighten people but while playing Quiz Game the students have a positive attitude towards the mistakes They think that the game is both enjoyable and educational. According to their answers Quiz game makes them learn German language better and also they think Quiz Game is a good application to learn German language. Most of the participants have the idea of the game is exciting. According to the data derived from their answers they think that they feel better comparing with the previous period. Besides the results of the posttest affirms that students developed themselves by playing Quiz Game. As it is clear digital games have a positive effect on not only students' academic development but also their thoughts about they learned.

CONCLUSION

According to results for the research, the participant students studying in primary school as young learners' German as second language in Halkali, Istanbul have common ideas about playing digital games during German language learning. It is clear from the interview answers that participants wrote most of them have positive attitudes and answers towards to the Quiz Game application; they almost all have the same positive adjectives towards the Quiz Game application. The results of the motivation inventory showed that 97 percent of the students think that playing Quiz Game is an important activity. Moreover, it is clear from the pretests and posttests most of the students increased their correct answers. Throughout the study reviewed, many of the factors recognized were the positive impact of games on a learner's learning process. The findings are very promising as maintaining or increasing a learner's learning desire will increase the chances of success throught the SLA process. As educators, teachers should always follow the new media during the learning environment.

Limitations

This study have been carried out to find out the thoughts of students about learning German language via Quiz Game question and answer application by using the methods of pre-test, post-test, an open ended questionnaire and a motivation inventory. Despite the fact that this study has been derived from the findings of research, further improvements can be made in future studies. A study with younger learners and elder learners may be conducted to enlarge the findings. Also a study

may been carried out for different subjects except clothes and the parts of a house. In order to amplify the research other surveys may been carried out through different digital games.

Recommendations

This study may have recommendations to be taken for consideration for further research. In addition, of this study, younger learners and elder learners may be conducted to enlarge the findings. A study for different subjects may be done to the learners as well. Yet, it is obvious that this type of schooling needs monetary support. Besides a control group of students in order to compare the test scores would make the study more reliable in terms of findings.

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APPENDICES

APPENDIX A

Pre-test

1. Sie brauchen Teller, Tassen, Messer und Gabeln.
a)Badezimmer b) Küche c) Schlafzimmer d)Wohnzimmer

2. Sie möchten neue Bettwäsche kaufen.
a)Schlafzimmer b)Küche c)Wohnzimmer d)Badezimmer

3. ___ gibt Licht.
a)die Lampe b)der Tisch c)das Bett d)der Fensterbank

4. ___ ist bequem.

a)der Schrank b)die Vase c)der Sessel d)der Terppich

5. ___ liegt auf dem Boden.
a)der Teppich b)die Lampe c)der Vorhang d)das Bild
6. Was trägt man an den Füßen?
a)die Hose b)die Schuhe c)die Krawatte d)die Handschuhe

7. typisches Kleidungsstück für Frauen ___
a)die Krawatte b)die Jeans c)der Pulli d)das Kleid

8. typisches Kleidungsstück für Männer___
a)die Krawatte b)die Bluse c)die Schuhe d)das Kleid

9. Wie lautet der **Artikel** zu "*Mantel*".
a)der b)die c)das d)deren

10. Wie lautet die **Pluralform** von "*Rock*"?
a)die Röcke b)die Rock c)die Rocks d)die Rockes

11. Wie lautet der Artikel zu “Sofa”?
a)das b)der c)die d)dessen

12. Ich ___ in Istanbul.
a)komme b)klatsche c)patsche d)wohne

13. ___ ist dunkel.
a)das Sofa b)der Sessel c)das Zimmer d)das Bett

14. Ich wohne in einem ___.
a)Haus b)Garage c)Garten d)Fensterbank

15. Im Schlafzimmer ist ein ___.
a)Lampe b)Bett c)Vase d)Bett

16. Ich will tanzen. Ich ziehe den ___ an.
a)Rock b)Handschuhe c)Hose d)Mantel

17. Ich will schwimmen. Ich ziehe den ___ aus.
a)Bluse b)Hose c)Handschuhe d)Pulli

18. Ich will schlafen. Ich ziehe die ___ aus.
a)Mantel b)Bluse c)Hemd d)Rock

19. Ich ziehe die ___ gern an.
a)Hemd b)Rock c)Sandalen d)Mantel

20. Ich ziehe den ___ nicht gern an.
a)Hose b)Hemd c)T-Shirt d)Pulli

21. Sie brauchen Glas, Teller, Topf.
a)Badezimmer b) Küche c) Schlafzimmer d)Wohnzimmer

22. Sie möchten ein neues Bettuch kaufen.
a)Schlafzimmer b)Küche c)Wohnzimmer d)Badezimmer

23. Man schläft auf dem ___.
a)Bett b)Tisch c)Lampe d)Fensterbank

24. ___ ist nicht bequem.
a)der Schrank b)die Vase c)der Sessel d)der Terppich

25. ___ hängt an die Wand.
a)der Teppich b)die Lampe c)der Vorhang d)das Bild

APPENDIX B
Post-test

1. Sie brauchen Teller, Tassen, Messer und Gabeln.
a)Badezimmer b) Schlafzimmer c)Wohnzimmer d) Küche

2. Sie möchten neue Bettwäsche kaufen.
a)Küche b)Wohnzimmer c)Schlafzimmer d)Badezimmer

3. ___ gibt Licht.
a)der Tisch b)das Bett c)die Lampe d)der Fensterbank

4. ___ ist bequem.
a)der Sessel b)der Schrank c)die Vase d)der Terppich

5. ___ liegt auf dem Boden.
a)die Lampe b)der Vorhang c)der Teppich d)das Bild

6. Was trägt man an den Füßen?
a)die Schuhe b)die Hose c)die Krawatte d)die Handschuhe

7. typisches Kleidungsstück für Frauen ___
a)die Krawatte b)das Kleid c)die Jeans d)der Pulli

8. typisches Kleidungsstück für Männer___
a)die Bluse b)die Krawatte c)die Schuhe d)das Kleid

9. Wie lautet der **Artikel** zu "*Mantel*".
a)die b)das c)der d)deren

10. Wie lautet die **Pluralform** von "*Rock*"?
a)die Rock b)die Röcke c)die Rocks d)die Rockes

11. Wie lautet der Artikel zu “Sofa”?
a)der b)die c)dessen d)das

12. Ich ___ in Istanbul.
a)komme b)wohne c)klatsche d)patsche

13. ___ ist dunkel.
a)das Zimmer b)das Sofa c)der Sessel d)das Bett

14. Ich wohne in einem ___.
a)Garage b)Garten c)Haus d)Fensterbank

15. Im Schlafzimmer ist ein ___.
a)Lampe b)Bett c)Bett d)Vase

16. Ich will tanzen. Ich ziehe den ___ an.
a)Handschuhe b)Hose c)Rock d)Mantel

17. Ich will schwimmen. Ich ziehe den ___ aus.
a)Bluse b)Pulli c)Hose d)Handschuhe

18. Ich will schlafen. Ich ziehe die ___ aus.
a)Bluse b)Mantel c)Hemd d)Rock

19. Ich ziehe die ___ gern an.
a)Hemd b)Rock c)Mantel d)Sandalen

20. Ich ziehe den ___ nicht gern an.
a)Hose b)Pulli c)Hemd d)T-Shirt

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21. Sie brauchen Glas, Teller, Topf.
a) Küche b)Badezimmer c) Schlafzimmer d)Wohnzimmer

22. Sie möchten ein neues Bettuch kaufen.
a)Küche b)Wohnzimmer c)Schlafzimmer d)Badezimmer

23. Man schläft auf dem ___.
a)Tisch b)Bett c)Lampe d)Fensterbank

24. ___ ist nicht bequem.
a)der Schrank b)die Vase c)der Terppich d)der Sessel

25. ___ hängt an die Wand.
a)der Teppich b)der Vorhang c)das Bild d)die Lampe

APPENDIX C
Game Interview Questions

İsim-Soyisim: _____ Tarih: _____
Sınıf: _____
Yaş: _____
QuizGame Röportajı

Lütfen soruları cevaplarken oynadığınız QuizGame uygulamasını düşünerek yanıtlayınız.

1. Oyun oynar mısın? Hangi oyunları oynarsın?
_____
_____.
2. QuizGame uygulamasını oynarken eğlendin mi?
_____
_____.
3. QuizGame uygulaması hakkında ne düşünüyorsun? Deneyimlerini paylaşabilir misin?
_____
_____.
4. Yaşadığın herhangi bir zorluk var mıydı? Paylaşabilir misin?
_____
_____.
5. QuizGame uygulaması ile Almanca dersinde kendini geliştirdiğini düşünüyor musun?
_____
_____.
6. Sence bu şekilde Almanca öğrenmek nasıl?
_____
_____.

Cevapların için teşekkür ediyorum.

APPENDIX D
Motivation Inventory

1	**Yaşınız:**		
2	**Cinsiyetiniz:**	☐ **Erkek**	☐ **Kadın**
3	**Mesleğiniz:**		

GÜDÜLENME ENVANTERİ

	Bu envanter iş güdülenmesi ile ilgilidir. Aşağıdaki ifadelerden her birinin sizin için ne ölçüde geçerli olduğunu (işiniz çerçevesinde) düşünerek 1'den 7'ye kadar olan numaralardan uygun olanını işaretleyiniz.	**Hiç gerçek değil (1)**	**2**	**3**	**Bir dereceye kadar (4)**	**5**	**6**	**Çok gerçek (7)**
1	Bu işi yapmak çok hoşuma gitti.	☐	☐	☐	☐	☐	☐	☐
	Bu işi yapmak eğlenceliydi.	☐	☐	☐	☐	☐	☐	☐
3	Bunun sıkıcı bir iş olduğunu düşündüm.	☐	☐	☐	☐	☐	☐	☐
4	Bu iş hiç ilgimi çekmedi.	☐	☐	☐	☐	☐	☐	☐
5	Bu işi çok ilginç buldum.	☐	☐	☐	☐	☐	☐	☐
6	Bu iş bence hayli eğlenceli.	☐	☐	☐	☐	☐	☐	☐
7	Bu işi yaparken çok zevk aldım.	☐	☐	☐	☐	☐	☐	☐
8	Bu işte iyi olduğumu düşünüyorum.	☐	☐	☐	☐	☐	☐	☐
9	Diğer çalışanlarla kıyaslandığında bu işte oldukça iyi olduğumu düşünüyorum.	☐	☐	☐	☐	☐	☐	☐
10	Bir süre çalıştıktan sonra bu işte epeyce yeterli olduğumu hissettim.	☐	☐	☐	☐	☐	☐	☐
11	Bu işteki performansımdan memnunum.	☐	☐	☐	☐	☐	☐	☐
12	Bu işte olabildiğince ustayım.	☐	☐	☐	☐	☐	☐	☐
13	Bu, benim pek iyi yapamadığım bir iştir.	☐	☐	☐	☐	☐	☐	☐

14	Bu iş için çok çaba sarf ettim.	☐	☐	☐	☐	☐	☐	☐
15	Bu iş için kendimi zorlamadım (çok çaba sarf etmedim).	☐	☐	☐	☐	☐	☐	☐
16	Bu iş için çok çabaladım.	☐	☐	☐	☐	☐	☐	☐
17	Bu işi iyi yapmak benim için önemliydi.	☐	☐	☐	☐	☐	☐	☐
18	Bu iş için fazla enerji harcamadım.	☐	☐	☐	☐	☐	☐	☐
19	Bu işi yaparken çok gergindim.	☐	☐	☐	☐	☐	☐	☐
20	Bu işi yaparken çok rahattım.	☐	☐	☐	☐	☐	☐	☐
21	Bu iş üzerinde çalışırken endişeliydim.	☐	☐	☐	☐	☐	☐	☐
22	Bu işi yaparken baskı altında hissettim.	☐	☐	☐	☐	☐	☐	☐
23	Bu işi yapmanın benim seçimim olmadığını hissettim.	☐	☐	☐	☐	☐	☐	☐
24	Bu işi seçip seçmeme konusunda doğrusu bir seçeneğim yoktu.	☐	☐	☐	☐	☐	☐	☐
25	Bu işi yapmam gerektiğini hissettim.	☐	☐	☐	☐	☐	☐	☐
26	Bu işi başka seçeneğim olmadığı için seçtim.	☐	☐	☐	☐	☐	☐	☐
27	Bu işi seçtim, çünkü seçmeyi istedim.	☐	☐	☐	☐	☐	☐	☐
28	Bu işi yapmam gerektiği için yaptım.	☐	☐	☐	☐	☐	☐	☐
29	Bu işin benim için epeyce faydalı olabileceğine inanıyorum.	☐	☐	☐	☐	☐	☐	☐
30	Bu işi tekrar yapmayı isterim çünkü bana bir şeyler katıyor.	☐	☐	☐	☐	☐	☐	☐
31	Bu işi yapmanın benim için yararlı olabileceğine inanıyorum.	☐	☐	☐	☐	☐	☐	☐
32	Bunun önemli bir faaliyet olduğunu düşünüyorum.	☐	☐	☐	☐	☐	☐	☐