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The effect of virtual reality on EFL writing performance

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Abstract

Today technological developments emerge in a blink of an eye with an astounding speed and each update or development is investigated by educational researchers to contribute educational research and practice. VR (Virtual Reality), one of these technologies, can be defined as the visual technology in which a person experiences various virtual environments through dedicated hardware and software. Having adopted a Sequential Exploratory Mixed Method, the current research was inspired by the virtual opportunity provided by VR technologies and aimed to examine the effect of VR experience on developing EFL writing skills. 24 freshman EFL students initially attended a semi-structured interview and watched a VR and a 2D traditional video in different time periods. After completing a short writing task, learners were interviewed again for post-experience opinions. The results showed that (1) EFL learners were aware of VR technology, (2) VR experience did not affect short term writing performance but was found to be promising in the long run and (3) a majority of learners enjoyed VR videos but also expressed a number of technical limitations such as low video quality and physical discomfort. VR technologies were also discussed in terms of language teaching research.

Keywords: Virtual reality; language learning; EFL writing; mixed method

1. Introduction

Developments in information and communication technologies are happening in the blink of an eye and this incredibly rapid process has been used in numerous practices for various purposes. One of these recent technologies; Virtual Reality (VR) has turned out to be a trendy technological application. VR encompasses numerous practices including gaming, simulation technologies and education. While being an expensive technology in the past, today VR applications are much more accessible. Due to its interdisciplinary nature, VR has many definitions in related literature. VR refers to the implementations by which individuals find themselves in a virtually created environment using various tools and interact with the environment (Çavas, Çavas & Can, 2004; Carrozzino, & Bergamasco, 2010). According to Rheingold (1991), VR refers to experiences in which users could walk around in three dimensional environments and this environment could be observed from all angles. The definition by Hay (1997) describes VR as the technology which simulates real-life

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experiences and constructs thoughts by using computers and various accessories, thus promoting communication between people, machines and other entities. Another definition handles VR as a novel technology that allows users to communicate in a dynamic medium by providing perceptions for sensory organs to feel real and feel like being in another place (Çavaş, Çavaş & Can, 2004; Bayraktar & Kaleli, 2007).

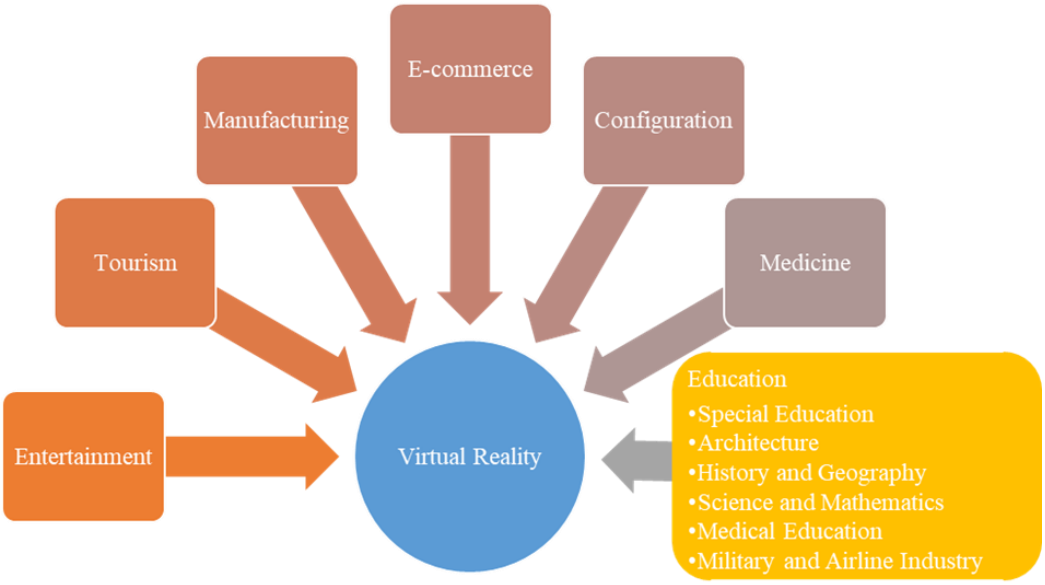


Figure 1. VR fields of Use

1.1. Theoretical Background

1.1.1. VR as an Educational Technology

Simply put, VR technology operates through VR software and hardware. While software connected to a computer processes the visual stimuli, hardware (VR goggles) displays visual content for the wearer. The users' sense of presence and interactivity are provided by the hardware, which is the basic characteristic of the VR applications. According to Kayapa and Tong (2011), the components of this technology are as follows:

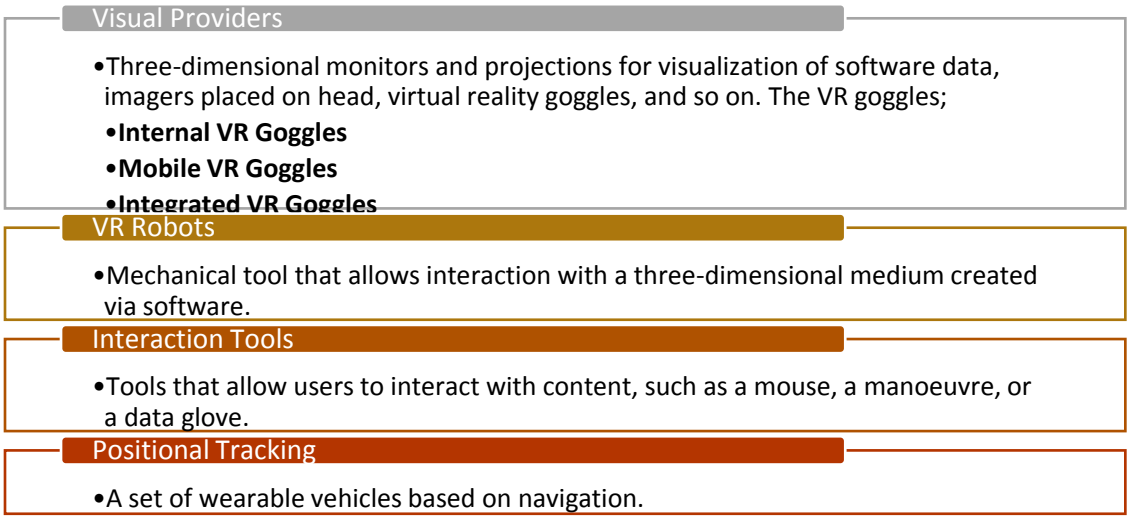


Figure 2. Components of VR Technology

VR technologies are not stable; since it is used in various disciplines such as medicine and education, its abilities and opportunities provided are continually updated. Its field of use have been expanded recently and applied in more areas such as gaming, sports, tourism and advertising. The large scope of VR enables its use in education also and thus, VR has recently been a tool of education technology. Çavas, Çavas & Can (2004) classified use of VR in education environments and Başaran (2010) classified use of VR implementations in all areas. A combination of these two classifications was given in Figure 1.

Widespread fame of computer assisted education fostered the use of VR technologies in educational settings in which VR was thought to be applied firstly in 1989 (Pantelidis, 2010). VR is no magic but what makes it attractive as an education tool is that learners are provided a virtual learning environment which boosts their interest and motivation (Başaran, 2010; Nooriafshar, Williams & Maraseni, 2004). Additionally, VR is economical and simulates learning environments which are nearly impossible in traditional classroom context (such as meeting a native speaker in London or visiting a museum in Washington), or organizing emotion arousing activities (observing a live dinosaur or meeting a shark in the deep ocean) (Nooriafshar, Williams & Maraseni, 2004). Eventually, it is widely accepted that VR technology could support education in both motivational and economic dimensions (Youngblut, 1998).

In a nutshell, VR provides an independent learning environment in which time and place are defined by the video material (Roussou, 2004). Additionally, it can provide an informal learning context which can support the learning gains acquired in classroom setting. Moreover, it presents both joyful and exciting course moments by simulating impossible and dangerous events in the classroom (Williams-Bell, Kapralos, Hogue, Murphy, & Weckman, 2015). Thus, it can be used to evaluate learner reactions and skill development. With these aspects, VR may provide valuable solutions in EFL settings in which learners do not have the opportunity to involve target language context in real life.

1.1.2. VR Technology and Language Learning: An Overview

VR is a visual experience which is distinguished with its feature of "reality" and the feeling of involvement. As an educational tool, it provides valuable opportunities to enhance learning. According to Dalgarno and Lee (2010), 5 main benefits made VR technologies unique and distinguished. First one is "Enhanced spatial knowledge of visual stimuli" which refers to the opportunity to explore the visuals as desired unlike 2D traditional videos. Secondly, "Tasks that would not be possible in real world" could be possible with VR such as visiting an arctic cave. Thirdly, "Enhanced motivation and engagement" means that VR boosts learner motivation and increases the involvement in activities. Next, "contextualized learning" is another opportunity in which learners are exposed to the input in the related context especially for CLIL (Shuster, 2016). And finally "effective collaborative learning" is easier with VR; learners can interact in real-like environments which enhance learning gains. In education, a number of research showed that VR use improved learning gains (Merchant, Goetz, Cifuentes, Keeney-Kennicutt, & Davis, 2014) and motivated learners (Gay & Santiago, 1994).

In language learning context, VR is yet in its infancy. Long term future predictions are fairly positive on the use of VR in learning and teaching a language (Lloyd, Rogerson & Stead, 2017) however, evaluation of language learning skills with VR application is not adequate. Among some recent research in language learning and the use of VR technologies, Yang, Chen, & Jeng, (2010) examined the effect of VR on simulating a learning environment including physical interaction. In their 6 stage lesson plan, learners physically interacted with the learning environment. Their results showed that learner motivation increased with VR and teachers developed a positive attitude towards

VR applications in language classrooms. In another research, Shih (2015) conducted a study aiming to improve culture acquisition by using VR technology. In her study, learners walked in the streets of London with an English guide presenting virtual objects, history and architect. Participants were also able to use chat and voice functions interacting with the guide. The results showed that learners benefited VR experience. Four learner factors, namely linguistic proficiency, motivation, character traits and attitudes were found to have predicted the rate of learning gains. The study by Ernest et. al., (2012) aimed to develop teachers' experience of online group work and to identify professional development needs in this area. Their study relied on the hands-on experience of a group of 20 language teachers and investigated some of the competences that are needed to successfully collaborate in virtual environments. Their results revealed the skills that teachers need to apply online collaborative learning in the virtual classroom. Some other studies also focused on second life and virtual environments in language learning (Wang, Calandra, Hibbard, & Lefaiver, 2012; Peterson, 2010), games and VR (Liu & Chu, 2010) and 3D instructional design (Ibáñez et. al., 2011).

1.1.3. Purpose and Significance of the Study

In relation to some previous related research, this study is significant as it aimed to examine the role of VR technologies on developing writing skill in EFL context. According to Jonassen (2000), use of Technologies could activate cognitive tools and enable meaningful learning. Thus, VR Technologies can improve learner capacity to perceive, imagine in a creative sense, especially for teaching abstract concepts (Burdea & Coiffet, 2003). Additionally, VR reduces cognitive load with the feeling of reality and immersion which boosts learner capacity to conceptualize and learn (Wetzel, Radtke, & Stern, 1994). Primarily, only 2D visuals (i.e. pictures, videos) are commonly used in language classrooms as a pre-writing activity to provide background information. Our study targets to evaluate the effects of 3D VR videos on learner retention of details on a given topic and its reflections on their writing performance. Another purpose is to investigate VR awareness of EFL students along with their liking of VR experience and the effect of VR technologies on EFL writing performance in contrast to 2D traditional videos.

1.2. Research questions

In accordance with the research aims, answers for the following research questions were sought:

1. Are the participants aware of VR technology?
    a. Have they experienced it before?
    b. What are the opinions of participants toward use of VR Goggles in EFL instruction?
2. Is there an effect of VR technology on EFL writing performance and remembering the details?
    a. What is the effect on VR on delayed writing performance?
    b. Can it provide long term retention in comparison to 2D traditional video?
3. What are the opinions of EFL learners towards VR after experiencing it in EFL context? Are there any limitations of VR?

2. Method

2.1. Design

This study adopted Sequential Exploratory Mixed Method in which qualitative data was analyzed first and then synchronized with quantitative findings (Cresswell & Plano-Clark, 2014). In this respect,

this study initially aimed to reveal VR awareness among EFL learners via the first set of qualitative data and then used quantitative data to examine EFL writing performance. For the final phase, second set of qualitative data was analyzed to examine learner ideas about their experience with VR. For quantitative data, this study adopted a within subject design in which all participants were tested under the same 2 conditions; VR and 2D Traditional Video.

2.2. Participants

24 EFL freshman students (12 males and 12 females) in an age range of 18 to 19 in an ELT department voluntarily participated in this study. Depending on the proficiency exam conducted in the beginning of this semester, all participants were intermediate learners of English. All participants also attended English preparation class last year and successfully passed. For sampling procedure, purposive sampling was adopted to obtain robust results and hold the effect of language proficiency constant.

2.3. Materials and Visual Stimuli

For VR experience, Samsung VR Goggles with Samsung S7 Edge Mobile Phone was utilized. This mobile phone can be attached to the VR goggles easily. 2 VR videos were chosen by the researchers; one was about Chernobyl and another one was giving brief information about bears and their natural habitat. Both VR videos included only short talks in English and duration for both videos was about 5 minutes in 800x600 resolution. For 2D traditional video condition, mp4 formats for the same videos were downloaded from YouTube and presented in classroom setting via a computer and a projector.

2.4. Data collection

To collect qualitative data, a semi-structured interview form was prepared by researchers. This form consisted of 6 open-ended questions and learners were required to respond freely. To ensure the validity of the interview form, opinions of 3 experts were obtained and the final version of the interview form was created with the help of Turkish language experts. Interviews were organized depending on voluntary basis and were recorded with an audio recording device for further transcription procedures.

For quantitative data collection, learners were instructed to write a short paragraph on the topic of the video right after attending either 2D video and VR sessions. They were free to use a bilingual dictionary and allocated time for the writing task was 15 minutes. As VR sessions were conducted individually, writing tasks after VR experience was conducted in an isolated room individually. For delayed writing tasks, the data was collected collectively in a classroom.

Writing scores were defined depending on inter-rater reliability; 2 instructors of writing scored each paper independently and their results were averaged. The raters also watched the videos before they assessed papers and instructed that they should score each paper solely depending on how much detail was given, thus minor grammatical and organizational errors were ignored.

2.5. Data analysis

Content analysis method was used to analyze qualitative data. Answers of interviewees stored in audio recording device were deciphered. The transcribed content was analyzed by creating related themes in the context of research questions. In order to sustain coding security during these processes, researchers worked on the same interview records. Coding security ensures that different coders code the same text or message accordingly or reach the same results in different times (Bilgin, 1999). At the

end of the analysis process, category and theme structures were created and relational structures were obtained.

To analyze quantitative data, Friedman Test (non-parametric equivalent of one-way repeated measures ANOVA) was preferred. The reason was that the data was observed to have been slightly skewed and kurtic with significant Shapiro Wilk values. In this respect, Friedman Test enables the analysis of non-normal repeated measures data as an extension of paired samples t-test with several levels of factor aiming to reveal any significant differences within factor levels (Field, 2005). As all learners were tested under the same 2 conditions in a within subject design (two levels as VR and 2D Traditional Video), this test suits best to reveal any statistical effect of VR experience.

2.6. Procedure

For the first phase of the study, 24 learners were interviewed and their VR awareness was evaluated. In the second phase, all participants were randomly assigned to VR and Video groups equally. While VR group individually watched a VR video "Chernobyl" with VR Goggles seating on 360º rotating chairs, the other group collectively watched the same video in 2D format projected on the wall in a traditional classroom setting. Thirdly, immediately after watching the video, all participants were given 15 minutes to write a short paragraph on the topic "Chernobyl" and were asked write down as many details as they remember. After one day, participants who watched the video with VR goggles were interviewed about their experience. Finally, for delayed writing task, all participants were asked to write about the same topic after a month.

For the next data collection procedure, same steps were applied but this time, participants who initially attended VR group were taken into 2D traditional video group. The previous video group also took all VR procedures. In this procedure, learners watched a video about "Bears and their habitat". With this way, all learners were exposed to a 2D traditional video instruction and VR experience. Learners' papers were then given to 2 raters for scoring.

3. Results

To assess and interpret the effect of VR experience on EFL writing performance, the results obtained were presented in accordance with the research questions.

3.1. Are the participants aware of VR technology? Have they experienced it before? What are the opinions of participants toward use of VR Goggles in EFL instruction?

According to the initial interview results, a vast majority of the learners stated that they have never experienced VR technology before (N:23, %96). However, they also mentioned that they heard of this technology in the internet, on TV or from their friends. They reported that they know how it works and what it provides.

Participants were asked how VR could be used as an educational tool in language learning and teaching. Their ideas on which skills (reading, writing, listening, speaking, vocabulary) VR could be implemented were examined. Each participant was allowed to express more than one opinion. Their ideas were summarized in Table 1:

Table 1. EFL Learner Ideas on the Use of VR

VR in EFL Learning and Teaching	Ideas	
	f	*%*
Listening	22	62,85
Speaking	8	22,85
Writing	4	11,42
Reading	1	2,85
Vocabulary	0	0

Initial results indicated that majority of learners thought VR technology provides most benefit for the development of listening skill. This was followed by speaking; learners thought VR could also be helpful for developing speaking skill. Only a few students thought that VR could enhance writing performance. Nearly no participant reported that VR technology could be used for developing EFL reading and vocabulary. Some examples were as follows:

> P_3: … actually, there may be an object its name written on it. By doing so, it may improve vocabulary skills. … For example, we have a speaking course, we always watch videos during the course. I think it would be great to look around while watching a video (means with VR here). I mean, it may develop speaking skills.
>
> P_4: I think it may be beneficial for listening, watching a series would be interesting as VR provides real like environment, people are real-like and when they talk, it may be much more memorable I guess because it is as if you are one of them. Listening may develop and vocabulary may be more memorable, it would be as if you talk with them as in real life.
>
> P_8: These real-like visuals would be great for listening courses. I mean it is so much beneficial for listening skills.
>
> P_13: I think it would not be beneficial for writing and reading though it may not pose something negative I guess…

3.2. Is there an effect of VR technology on EFL writing performance and remembering the details?

Initial qualitative findings showed that some learners thought VR can boost EFL writing performance. Thus, this section presented quantitative findings with regard to the effect of VR on writing skills.

Some variables in the data was observed to have skewed and kurtocic with significant Shapiro Wilk values indicating deviation from normality. Shapiro Wilk was given as it is widely used and recommended (Ghasemi and Zahediasl, 2012). Thus, Friedman Test was adopted.

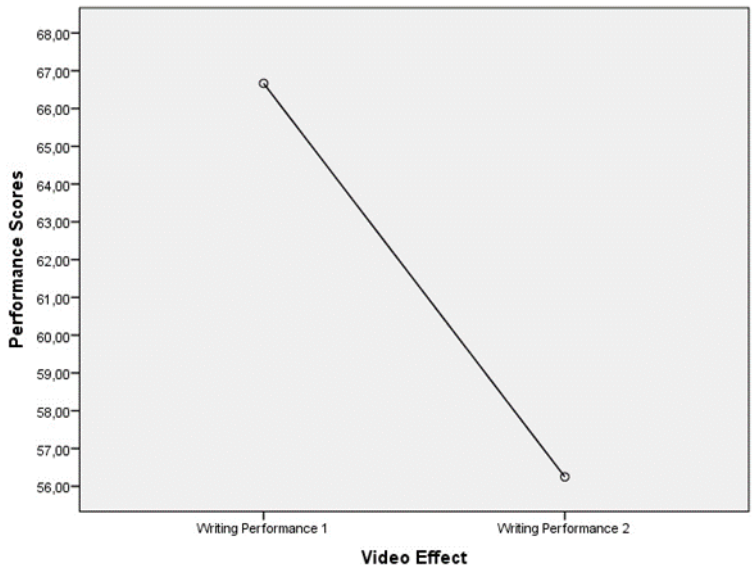
Table 2. Shapiro Wilk Values

Writing Performance	Shapiro-Wilk		
	Statistic	df	Sig.
2D Video Initial	,918	24	,053
2D Video Delayed	,920	24	,059
VR Initial	,854	24	,003
VR Delayed	,778	24	,000

To investigate whether VR procedure affected EFL writing performance or not, a Friedman Test was performed. Results showed that learners scored slightly higher in 2D traditional video condition (M=67, SD=11) than they did on VR condition (M=63, SD=12). Friedman Test results of VR and 2D video scores indicated that there was a differential rank ordered performance for these 2 conditions; (X^2(1)=3.85, p<.05. No post hoc was applied as there were only 2 levels. In sum, learners did significantly better in traditional 2D video condition than they did in VR condition.

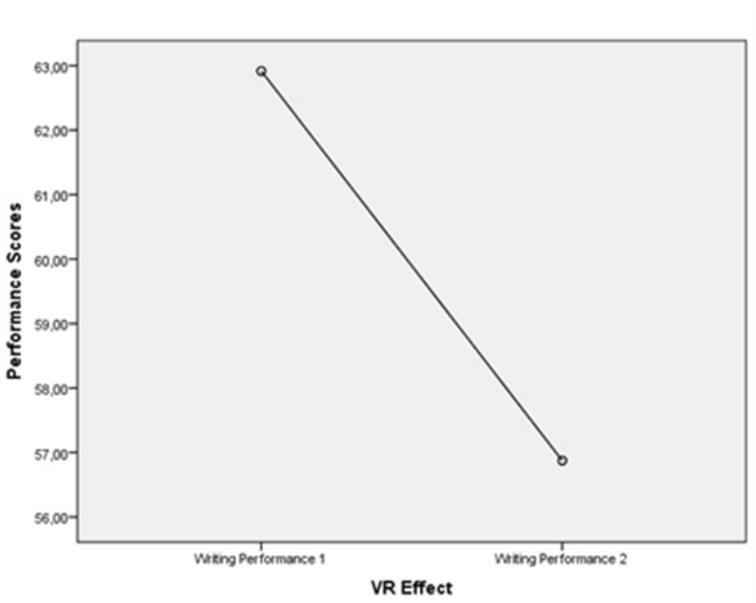
3.3. Can VR provide long term retention in comparison to 2D traditional video?

Initial Friedman Test results indicated no superior effect of VR on EFL writing performance. This research question aimed to reveal if VR would affect long term retention of details and delayed writing performance. To investigate the effect of VR in more detail, writing performances in initial and delayed sessions were also analyzed. For this analysis, a Friedman test was conducted to determine whether participants had a differential rank ordered test scores for initial and delayed 2D video conditions. Initial 2D video scores (M=67, SD=11) decreased by over 10 points in delayed 2D video condition (M=56, SD=7). This decrease was observed to have been significant; (X^2(1)=22.0, p<.05. In sum, learner scores significantly decreased for over 10 points in 2D traditional video condition. No post hoc was applied as there were only 2 levels. A line graph presenting the performance decline was as follows:



Graph 1. Two-Timed Writing Performance in 2D Traditional Video Condition

Similar to previous procedure, another Friedman Test was performed to examine initial and delayed VR writing performances. Initial VR scores (M=63, SD=12) decreased by 6 points in delayed VR condition (M=57, SD=11). This decrease was also observed to have been significant; (X^2(1)=16.2, p<.05. In both 2D video and VR condition, delayed writing performances significantly decreased and learners were exposed to memory decay. However, this decrease was slightly less for VR condition. No post hoc was applied as there were only 2 levels. The graph illustrating the decrease was as follows:



Graph 2. Two-Timed Writing Performance in VR condition

Quantitative findings showed that VR did not significantly affect EFL writing performance. On the contrary, learners scored better in traditional 2D video condition than they did in VR condition. For delayed writing performance, learner writing performance significantly decreased after a month in both traditional 2D video and VR conditions. Albeit, this decline was less in VR condition in which writing scores decreased for about 6 points in comparison to 2D traditional video condition in which a decrease of 10 points was observed. In this respect, the assumption was that EFL learners slightly remembered more details in the long run when they acquired background information with VR for writing purposes.

3.4. What are the opinions of EFL learners towards VR after experiencing it in EFL context? What are its cons and pros?

After VR sessions and writing tasks, learner ideas were examined via interviews. All learners generally liked the new technology and the experience (N: 24, %100). In this respect, why they liked VR was analyzed through content analysis by constructing themes. Each participant was free to express several opinions. The positive themes were presented in Table 3.

Table 3. Positive Themes on VR Experience

+ Themes	Like Ratio	
	f	*%*
Real-like environment	22	42,3
Feeling of involvement	20	38,5
Excitement	5	9,6
Joy	3	5,8
Ease of use	1	1,9
Detailed observation	1	1,9

According to the results, real like environment and feeling of involvement were observed to be the most liked features of VR experience among EFL learners. Additionally, excitement and joy VR provided were other factors that learners liked. Some ideas were as follows:

> P_1: It was really portable and feels real, as it works with a mobile phone, it can be used at anywhere. Firstly, you are not limited like a normal video, you can look and observe anywhere on the video, you can see more details. Thus you can have more opportunity to learn about the environment.
>
> P_2: It was strange at first, as if I was in somewhere different. But then I used to it, I noticed that I have fear of heights, it was as if I was about to fall. It was exciting. Also as far as I know Chernobyll is a forbidden place, impossible to go and take a look around. With VR it was as if I was there.
>
> P_4: It was real-like, I could go deep and take a look around easily.
>
> P_7: …it is as if real, more detailed…I mean it was as if you are there at that moment, it is exciting…
>
> P_8: It was very real, I experienced different feelings. For example, while you flying, it rises a fear like emotion. The rotating chair affected me also, I could turn whenever I wanted, without it, I don't think I could feel so real.
>
> P_9: I felt as if I was in the room, all that dirty walls, as if it smells…other friend watched it in projection, I think I saw more than they saw…it was not like a normal video, it made me feel real.

Although participants generally liked VR experience, they also reported a number of limitations. These limitations were not about the technology but were mostly about implementation process. Participants were free to express more than a single opinion. Negative themes were given below:

Table 4. Negative Themes on VR Experience

- Themes	Like Ratio	
	f	*%*
Video quality	8	50
Fear	4	25
Dizziness – Headache – Eye fatigue	3	18,75
VR goggle size	1	6,25

Top limitation reported was the quality of the video used. Learners complained about the quality of the video and stated that high resolution videos would be better. Additionally, the results also showed that video quality and feeling of reality were in parallel. Although VR goggles were portable, some learners mentioned that it was heavy and did not fit their heads well. Moreover, in long term use, learners stated that there might be some problems such as dizziness and eye fatigue. Sample participant ideas on limitations were given below:

> P_10: I guess video was in low quality. Wish it would be better, it would be more realistic.
>
> P_11: In the video, there were some scenes in which I rise to the sky, very high, I felt dizzy. For example, on the helicopter especially, I felt dizzy. It was so realistic.

P_12: For a limitation, I think we are too stable, I mean we just stay where we are. Wish this technology would be further developed that we walk and explore more, I guess these technologies exists. With this feature it would be incredible!

4. Discussion and Conclusions

Our results showed that VR did not affect EFL writing performance but it affected long term retention. Additionally, the findings showed that EFL learners were aware of this technology and reported some pros and cons about it.

The study showed no significant effect of VR experience on EFL writing performance. Quantitative results indicated that 2D traditional video condition improved writing performance better than VR condition did. However, related literature showed that VR videos attracted more learner attention with its content (Freina & Ott, 2015). In this respect, this attention was expected to have a facilitative effect on retention (Dolgunsöz, 2015). Our findings contradicted with these expectations; VR experience did not provide any short term positive effect on EFL writing performance. This may due to the very nature of VR in which users were totally in control of the environment and had to move and turn around to see the details unlike 2D traditional videos in which all details were presented at the same time. Hence, VR users might have missed some details as they were required to turn and look around to see more details. When they turned or moved their head to see more, they might have missed some details. As a result, this self-control status might have affected the number of details exposed.

Although initial analysis of 2D video writing performance was found to be better, VR users were observed to have slightly scored more than learners who watched 2D traditional video in terms of delayed writing performance conducted after a month. This finding may be interpreted as the positive effect of VR experience on long term retention. It was also supported by a number of related research proposing that VR experience could support long term retention and inhibit time-decay effects on memory (Dong, 2016; Freina & Ott, 2015; Garland, Vasquez and Pearl, 2012). In sum, VR technology is not a miracle solution in short term EFL writing instruction but may seriously support retention and performance in the long run. In this respect, VR can be utilized in long term instructional designs to support learner retention and writing performance in EFL classrooms.

Regarding qualitative findings, EFL learners were knowledgeable about VR technologies. The results indicated that learners were aware of VR technology via social media, friends and internet. This awareness may be due to the rapid development of VR technologies recently (Dong, 2016). Additionally, reasonable prices for VR and the increase of new VR content might have boosted the number of users recently and improved VR awareness. (Ferrer-Garcia, Gutiérrez-Maldonado & Riva, 2013; Parsons, Rizzo, Rogers & York, 2009; Wiederhold, 2006).

Learners presented positive opinions towards the use of VR in EFL instruction beside a number of technical limitations. EFL learners thought that VR technologies were promising and motivating. A majority of the learners found VR enjoyable and effective as it could present a real-like learning environment and created a feeling of involvement. Especially, some features of VR technologies such as amusement, ease of use, user friendly interface and portability provided positive outcomes among learners. These findings confirmed previous related research which especially emphasized the feeling of reality and involvement VR provided (Dong, 2016; Earnshaw, 2014; Hensel, 1992; Hussein & Nätterdal, 2015). Yet, VR is a developing technology and learners also expressed some emotional, technical and comfort related limitations. Our findings showed that primary limitation was the quality of the video. In this respect, Zara & Slavik (2003) previously argued that a number of problems related

to VR experience might have emerged as VR videos had relatively in lower video resolution and quality when compared to other video environments and real life visuals. Personal fears (i.e. fear of height) also were reported to be a limitation. Additionally, feeling of discomfort was also expressed by some learners mainly due to the goggles used. This finding confirmed a recent research by Yildirim (2017) who proposed that prolonged use of VR might bring about a number of physical discomfort. However, when compared to pros of VR, these cons were much less.

In general, EFL learners were not only amused by VR experience but also reported a number of drawbacks. This amusement might have been a result of the novelty of the technology and learners' first experience with VR. Regarding EFL writing performance, VR is no miracle and cannot provide short term solutions. Instead, VR technologies should be embedded in the language curriculum and their effects should be tested in long term language instruction. It still requires some technical and content related improvements such as increased resolution and quality to be effectively used in language teaching.

4.1. Recommendations and Further Research

A similar but longitudinal study may be carried out with more learners from different age groups. The effect of VR technologies may be examined regarding other language skills; speaking, listening and reading.

4.2. Limitations

This study was conducted only with university students. Younger learners may respond differently. Only 2 contents were used to assess EFL writing performance, more videos may be used in a long term study.

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Sanal gerçeklik teknolojisinin yabancı dil olarak İngilizce öğretiminde yazma becerisine etkisi

Öz

Günümüzde teknoloji alanında yaşanan gelişmeler göz önüne alındığında eğitim ortamlarında çok sık olarak farklı teknolojiler kullanılmakta ve öğretimsel etkileri incelenmektedir. Sanal gerçeklik uygulamaları da bu teknolojilerin en son örneklerinden biri olarak karşımıza çıkmaktadır. Sanal Gerçeklik kişinin sanal ortamla birebir ilişki içinde bulunduğu ve etkileşime geçebildiği modern bir teknolojidir. Çok aşamalı açımlayıcı karma desene sahip bu çalışmada İngilizceyi yabancı dil olarak öğrenen 24 öğrenci hem sanal gerçeklik hem geleneksel 2 boyutlu video izlemiş ve yazma performanslarına bakılmıştır. Ayrıca tüm öğrencilerle yarı yapılandırılmış röportaj yapılmıştır. Çalışma sonucunda; VR teknolojisinin kullanıcılar tarafından kullanılmasa bile medya, arkadaş ve sosyal ağlar gibi ortamlarla bu teknolojiden haberdar oldukları görülmüştür. Nicel sonuçlar öğrencilerin geleneksel video da daha başarılı olduğunu göstermiş olsa da, sanal gerçeklik tecrübesi uzun süreli hafızaya daha olumlu etki etmiştir. Sanal gerçeklik uygulamalarının sunmuş oldukları gerçeklik ve ortamda bulunma hislerinden dolayı kullanıcıları tarafından çok fazla beğendikleri görülmüştür. Ancak sunulan içeriğin görüntü kalitesi gibi teknik özellikleri beğeni durumunu olumsuz yönde etkileyebilmektedir.

Anahtar sözcükler: Sanal gerçeklik; dil öğrenimi; yazma becerisi; karma desen

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