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A Content Analysis of Virtual Reality Studies in Foreign Language Education

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Abstract
The use of Virtual Reality in education has been highly prevalent in recent years. In nearly every domain of education, integration of Virtual Reality has been ongoing including foreign language teaching and learning. There is a huge shift in teaching and learning facilities from conventional classrooms to interactive ones. What makes Virtual Reality special in comparison to other technologies are immersion, interaction and involvement properties. Therefore, the purpose of this study was to analyze the studies on foreign language learning and teaching through virtual reality technology and to highlight the current trends on this topic, thus propose some suggestions for future researchers of this field. Document analysis method was used in this study. Like other analytical methods in a qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge. 40 research papers published between the years 1995 and 2015 were scanned in terms of data collection tools, research design, sample, sample size, data analysis method, and the topic of the paper. The results of the study revealed that document analysis was in the first place in terms of data collection tool and half of the studies were qualitative. In addition, undergraduate population was primarily the focus of attention. As from sample size, 101-300 size was primarily used. Moreover, effectiveness of virtual reality and game-based learning were the two outstanding topics of these studies.

Keywords: language learning and teaching, virtual reality, VR in language education, technology

Introduction

In a world with digital natives, it seems inevitable not to realize technology integration into almost every domain of people's lives and daily activities. Technology has been integrated into people's lives via computers, mobile devices, social media platforms, digital cameras, etc. However in the last decades, the use of virtual reality for educational practices has increased. Many varied tools and practices of technology are available and educational practices can benefit from them with the effective use of technology in the teaching curriculum. As one of these offspring of technology, Virtual Reality (VR) can be defined as computer generated artificial worlds or immersive environments in which learners explore and interact with. The basic idea of VR is to give the impression and feeling of being

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somewhere else by tricking our brains in an artificial sensory world. Psotka (1995) states that "What distinguishes VR from all preceding technology is the sense of immediacy and control created by immersion: the feeling of "being there" or presence that comes from a changing visual display dependent on head and eye movements".

Various kinds of VR are available depending on the level of immersion and features. Main VR environments can be divided into 3 categories called text-based, graphical and three dimensional. Educational or social environment of text-based VR environments are MUD (Multi User Dungeon) and MOO (Multi-user domain, Object-Oriented). Compared to other VR environments, they enable low-cost, supportive environments for online activities. Graphical virtual reality environments are similar to text based ones. Differently, they integrate graphics to indicate users' domain in the environment and text is limited to speech bubbles. The last one is three dimensional (3-D) immersive virtual reality environments. They are high-tech, three dimensional sensory realities generally calling for head mounted displays and data gloves. Avatars, visual representations of users, symbolize their presence in the virtual reality environment. Most common 3D virtual reality applications are active world, second life, Croquet, etc.

In the light of recent studies, it seems quite reasonable to use virtual reality in learning and teaching foreign languages. When the learning is stimulating, children keep their attentions on language learning; therefore, in theory, the activities should be devised in a way that it will be attractive for learners (McGlothlin, 1997). Virtual reality gives the learners a feeling of presence in the learning environment and keeps them alert. Using virtual reality in language teaching can foster learning in that learners can behave differently in an online platform. People's behavior can change or at least appear to be different when working online compared to the behavior they would display in a classroom setting (Roed, 2003). Teachers can benefit from this situation by integrating virtual reality into traditional classrooms. Virtual reality is an ideal language learning environment that includes social learning, immersive learning, creativity and relevance. In 3D virtual environment, learners meet with others; they share and use their creativity by means of telepresence.

In this meta-analysis study, 40 articles about virtual reality and second language learning practices are analyzed with respect to specific domains. It is aimed that the results of this study will suggest a course of action for the future researchers about virtual reality and second language learning.

Method

Document analysis method was used in this study. Forty papers published in foreign language education through virtual reality in blind peer-reviewed journals were scanned in terms of data collection tools, research design, sample, sample size, data analysis method, and the topic of the paper. In this study, it was aimed to highlight the current trends in this field and to give some clues for future studies. The following hypothesis questions were answered in this study.

1. Which topics were frequently studied in these research papers?
2. What data collection tools were frequently used?
3. Which research designs were frequently applied?
4. What were the types and level of samples, and sample sizes in these research papers?

FINDINGS

In this section, the data collected from the documents were assessed through excel program and presented in the form of tables below.

Table 1: Data collection tools

Data collection tools	N	%
Observation	1	2,5
interview	-	-
achievement tests	-	-
Questionnaire	7	17,5
Documents analysis	18	45
Alternative instruments	-	-
More than once	14	35
Total	40	100

Table 1 displays the number and the percentage of data collection tools used in the relevant literature. In these studies, Document analysis (45%) was in the first place, and questionnaires (17,5%) were in the second. In addition, in one study (2,5%), observation was the data collection tool.

Table 2 : The research design of studies

Research Design	N	%
Quantitative	14	35
Qualitative	20	50
Mixed	6	15

Table 2 shows the research design of studies conducted on this topic. While 50 % were qualitative, 35% of the studies were quantitative. In addition, mixed design was used in 15% of the studies.

Table 3: The sample group and the sample size

Sample	N	%
Elementary (1-4)	1	2,5
Secondary (5-8)	2	5
High school (9-12)	2	5
Undergraduate	11	27,5
Post graduate	6	15
Not applicable	17	42,5
Sample Size	**N**	**%**
1-10	2	5
11-30	5	12,5
31-100	6	15
101-300	7	17,5
301-1000	2	5
more than 1000	-	-
not applicable	18	45

Table 3 indicates the sample group and the sample size of the studies. While undergraduate population (27,5%) was in the first place, postgraduates (15%) were in the second. As from sample size, 101-300 sample size (17,5%) was primarily used and then 11-30 size (12,5%) was used in the second place.

Table 4: Topic of papers

Topic of the paper	
CALL	3 7,5%
game-based learning	7 17,5%
theoretical background and literature review	6 15%
potential benefits and drawbacks	5 12,5%
effectiveness of virtual reality	14 35%
social networking	1 2,5%
attitudes	4 10%
Total	40 100%

Table 4 illustrates the topics of the papers published in this field. The effectiveness of virtual reality (35%) was primarily the focus of attention. Secondly, game-based learning (17,5%) was taken into consideration by the researchers. On the other hand, social networking was the aspect of virtual reality studied the least of all in foreign language education

Discussion and Conclusion

This study focused on the studies conducted in the domain of virtual reality and foreign language learning. Studies mentioned above are mostly qualitative in nature and as a data collection tool document analyses is the most commonly used one. Göktaş et al. (2012) and Kelly & Lesh (2000) state that qualitative research methodology has started to be more preferred than quantitative methodology in recent years, and this study also supports their findings. Fifty percent of the studies analyzed above are qualitative. Moreover, in a literature review about recent developments in technology and language learning, Zhao (2003) asserts that experimental studies are inadequate about technological applications in language learning and most of the studies are descriptive or theoretical. With regards to sample, it is observed that undergraduate population is most prevalent and elementary sample population is the least common used. In the review of previous empirical studies conducted by Hew & Cheung in 2010 about the use of 3-D virtual Worlds in both K-12 and higher education settings, it is also stated that most of the studies are conducted in university settings and they are mostly descriptive studies. Elementary, secondary and high school sample populations are lower compared to other populations. In the study of Zhao (2003), it is also stated that participants of all the analyzed studies are college students and adult learners. This situation threatens external validity of the conclusions. Learners may diverge in motivation, language background and learning styles. A document analysis study conducted by Korkmaz (2015) about new trends on mobile learning also supports the findings. It is asserted that most of the studies focus more on higher education and the number is relatively fewer in high school level. The probable reason behind this result can be explained in terms of interest group and study feasibility. Students in higher education can more effectively and commonly use technology for academic and social reasons and as researchers are in the university environment, it is easier for them to choose and observe the sample group for their studies.

When the topic of the papers is examined it has been seen that studies center on the effectiveness of virtual reality and game- based learning follows this. In a study conducted by Hew & Cheung in 2010, it is stated that earlier studies about virtual reality are mostly about media arts and health and environmental fields. This shows that virtual reality has started to be used more frequently in disciplines of education in the last decades. It is also seen that there is a gap in the literature about language teaching and learning by means of virtual reality in the area of CALL and social networking. Levy (1997) has stressed that one of the major obstacles to CALL research has been inadequate subsequent research in a new area and Second Life. As a new area of study in CALL, virtual reality assisted language learning (VRALL) should be emphasized. Consequently, it is seen that more studies should be conducted in the area of virtual reality and foreign language teaching and learning. Current studies conducted in this area show that when used properly, Virtual Reality can enhance foreign language learning to a great extent. However this meta-analysis shows us that the capacities of Virtual Reality have not been utilized adequately in foreign language teaching and learning facilities. Cuban (2001) asserts that the use of technology in classrooms is not adequate. It is also evident from the results that there is still more to be discussed in that area: implementation to the curriculum, evaluation process, social networking and virtual reality in CALL etc. As a suggestion for further studies, more longitudinal studies can be implemented to observe the effect of virtual reality reliably.

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