Oral Functional Assessment Training in Speech Therapy Students using Virtual Reality (VR)

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ABSTRACT

Aims In this study we examined the use of Virtual Reality (VR) in oral organs assessment training in speech therapy students.

Method The population of this study included 35 fifth term students of speech therapy in Jundishapur Medical Science University of Ahvaz. The first group was 18 students entering university in 1394 passed oral function assessment course through traditional training method. The second group was 17 students entering university in 1395 passed this course through traditional training method with Virtual Reality. 3D (Three-Dimensional) glasses and a monitor are the tools applied in Virtual Reality technique allowing the student to touch the oral organs and experience various oral functions recognition.

Findings The first group was 20-22 years old (20.35±2.14) and the second group was 20-22 years old (20.18±3.06). The mean and standard deviation of the final score in students used Virtual Reality was 18.57±1.31 and for the students used traditional method were 14.35±2.15. Independent-T test showed a meaningful difference between the two groups (p<0.001).

Discussion Using Virtual Reality in classroom resulted in an increase in students' scores. Hence taking into account the great importance of teaching method, its effect on the society and health organization, it is necessary for the education system to use a technology which increases teaching quality and creates more effective learning in students.

Keywords Virtual Reality; Learning; Oral Function

CITATION LINKS

[1] Theoretical foundations of educational technology [2] Virtual reality training for the operating room and cardiac catheterisation laboratory [3] Gamification and multimedia for medical education: A landscape review [4] Simulation-based medical education: An ethical imperative[5] Rate of undesirable events at beginning of academic year: Retrospective cohort study [6] Virtual reality for medical training: The state-of-the-art [7] Deliberate practice and the acquisition and maintenance of expert performance in medicine and related domains [8] American medical education 100 years after the Flexner report [9] Constructivism and the technology of instruction: A conversation [10] Virtual reality as a tool in the education [11] Virtual reality in rehabilitation and therapy [12] Using virtual reality for medical diagnosis, training and education [13] Use of virtual reality in medical education - reality or deception?

Introduction

Training is one of the most important and major sources in human resource growing and today attracted attention of all societies including developed and developing countries. Effective training gives individuals the ability and importance of learning so that the learning process continues after the training course is finished. Training is not a lifelong process but learning can be and it can put the human in a continuous improvement and progress process [1]. Despite the change in techniques and tools used in clinical medicine, training in medical science had not changed for years and traditional methods were used in this field [2]. Increase in refers to medical specialists, the students entering medical science universities getting familiar with a high level of technology, and their expectation of teaching lesson plans by using novel and various technologies resulted in technology entrance in medical science training and its progress [3].

Since dangers threaten patients following traditional training [4, 5], the pressure to find effective substitutions for traditional practices increase by technology emergence and development in medical science training [6]. So instead of facing these patients with these dangers before visiting the patients, it is better for medical science students to have a comprehensive training using stimulating [7, 8].

In modern training, students need to understand complicated and abstract concepts so there are common methods to teach abstract concepts [9].

Today Virtual Reality (VR) assignments play an important role in changing gradual training process following technology entrance in this field [10]. Virtual Reality is a technology substituting sensory inputs derived from the real world with inputs derived from computer stimulating [11]. There are various definitions for VR, but generally it is a comprehensive experience showing 3D pictures of the real world using computer. In other words, a real world is stimulated using a computer [12]. Today VR is considered as an appropriate activity in different fields including informatics, education, rehabilitation, medical, entertainment, military technologies, and space technologies [11].

A lot of studies have been done on using VR in training [6, 4, 10, 12], but there has not been any study done on using VR in rehabilitation majors' teaching such as speech therapy. Oral organs' assessment is one of the most common items in speech therapy patients' assessment so it is necessary for speech therapy students to know the complete and correct assessment of oral organs and gain enough information in their training years. Thus this study aimed at using Virtual Reality (VR) in teaching oral organs' assessment to speech therapy students.

Methods

The population of this study included 35 fifth term students of speech therapy in Jundishapur Medical Science University of Ahvaz. The first group was 18 students entering university in 2015 passed oral function assessment course through traditional training method. The second group was 17 students entering university in 2016 passed this course through traditional training method with virtual reality. 3D (Three-Dimensional) glasses and a monitor are the tools applied in virtual reality technique allowing the student touches the oral organs and experience various oral functions recognition.

The 3D monitor is similar to the combination of big glasses with a hat. It includes two very small monitors having wide visibility and providing appropriate eyesight so that the individual can see nothing but his or her own eye space and is able to easily see the pictures of that space.

There are two speakers with sound playback on both ears on the monitor and involve the individual in the virtual environment acoustically. There is a head movement tracer sensor on the glasses signaling the user's head movements to the computer and the use can change his or her viewing angle by moving his or her head. In the virtual world, gloves operate as hand, and since the user cannot use the keyboard, he or she can use the gloves to pick up virtual things, navigate, touch, and point to different directions. Glove gives the individual a more real feeling in the virtual world by touching oral organs. The score of oral function assessment was recorded at the end of each term.

Findings

The present study was done on 18 students entering university in 2015 (5 boys and 13 girls) in the age range of 20-22 (With age mean of 20.35±2.14), and 17 students entering university in 2016 (4 boys, and 13 girls) at the age range of 20-22 (With age mean of 20.18±3.06). Independent-T Test showed no meaningful difference between age mean (p=0.23), and sex (p=0.32).

The mean and standard deviation of the score in students used virtual reality in oral function assessment was 18.57±1.31 and for the students used traditional method were 14.35±2.15. Independent-T test showed a meaningful difference between the two groups (p<0.001).

Discussion

The main goal of the present study was to examine the use of VR in teaching oral organs assessment in speech therapy students, the findings showed that using Virtual Reality in classroom resulted in the increase in students' scores. Our findings are compatible with the ones in Jibury, Piovesan *et al.* and Al-khallifah *et al.* [10, 12, 13].

In 2016, Jiburiy studied the application of Virtual Reality in medical education and concluded that using Virtual Reality is useful for students to stimulate special conditions in emergency such as CPR therapy.

In 2012, Piovesan *et al.* studied the use of Virtual Reality as a tool in training. Using training software, they trained the students of the formal language major in person and in distance. Using this software, the students were able to examine the goals through 3D pictures. The findings showed that the training software using virtual status stimulates real conditions for students and provides a learning opportunity in real conditions for students and results in increasing motivation and interest for learning.

In 2006, Al-khalifah *et al.* studied the use of Virtual Reality for medical diagnosis, therapy, and training. They used some of the Virtual Reality software developed in the last 18 months and studied the effectiveness of these methods on helping the doctors diagnose and identify disability causes, and the effect of the methods on students training. The findings showed that Virtual Reality is a more effective method for doctors and it can appear as a special comprehensive model in diagnosis and training.

Based on these findings, Virtual Reality technology results in increase in attention, concentration, and motivation in students passed aphasia course using this technique, and it facilitates learning in these students. Also Virtual Reality structure is so flexible in training and lets the students know this technology in different situations and sometimes new situations to choose, each one can be a type of learning.

Conclusion

Considering the great importance of teaching method, its effect on society and health organization, it is necessary to use the technology in education system to increase teaching quality and create more effective learning in students.

Ethical permissions: The case was not found by the authors.
Conflicts of interests: The authors have no conflict of interest.

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