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The Use of Virtual Reality Software in Descriptive Writing Instruction

by

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Abstract

Virtual reality software is a recent technological advance that has the power to transform a classroom. According to research reports, “active learning produces superior mastery of complex ideas versus passive learning” (Mayrose, 2012, p.13). This software provides users with innovative experiences that are active, immersive, and engaging. These tools also assist students in establishing meaningful content knowledge and demonstrating deep understanding of concepts (Pilgrim, 2016). This study was designed to explore how the use of virtual reality experiences, using virtual reality software and glasses, impacts descriptive writing instruction.

This study was conducted in an elementary school located in a southeastern state in an urban community. This school is Title I and located in the center of a neighborhood where 45% ride the bus, 30% of students walk to school, and the remaining 25% are car riders. This school serves grades K3-5 with a total of 350 students. Fifty-three percent of the student population is male and 47% is female. In this school, 60% of students are African-American, 24% of students are Caucasian, 14% are Hispanic, 1.7% are Asian, and 0.3% are American Indian. Of the 350 students, 100% of students receive free lunch. This fourth-grade class consists of 22 students, 9 female and 13 male. Of these 22 students, 64% are African American, 27% are Caucasian, and 9% are Hispanic. This classroom is separated into two tables of 10 students and 12 students, in which students are free to choose their seats. This class focuses on English and Reading, with students of mixed ability, ranging from low to high levels. They frequently work in centers and
rotation activities, but with very little whole-group instruction. Each class period has time allotted for silent reading and journal writing. The instruction is a combination of small and whole group with mainly independent activities. In this fourth-grade English classroom, descriptive writing is an area of weakness in student performance. The teacher struggles to assist students in writing descriptively about detailed experiences due to students’ lack of experiences to write about. When instructing students to write descriptively about places and locations, the teacher must expose students to photos and videos to provide them with material to write about. Potentially, one reason this problem occurs is students’ different range of experiences than what is expected from the teacher. By requiring students to write detailed descriptions about experiences they are unfamiliar with, the teacher’s writing instruction is ineffective. By incorporating virtual reality glasses into writing lessons, students will have the opportunity to experience new environments and practice descriptive writing skills. Also, these glasses allow each child to experience the same environment so the teacher can be objective when grading. Due to the problem stated above, this environment led me to research: How can the use of virtual reality experiences, using virtual reality software and glasses, impact my ability to teach descriptive writing?

Review of Literature

Virtual reality (VR) constitutes “computer-generated environments that simulate the physical presence of people and/or objects and realistic sensory experiences” (Pilgrim, 2016). When using VR software, users can interact with 3D images and simulations that create immersive, authentic experiences. In a technological era, computer-generated images can provide vivid visual, auditory, and kinesthetic interactions that have not been available in the past (Chen, 2012). The military industry uses virtual reality software as a training tool and in gaming testing environments (Pilgrim, 2016; Mayrose, 2012). According to James Mayrose (2012), this emerging software is expanding into the educational world and on the cusp on creating immense impacts on the modern-day classroom.

In a study conducted by Chwen Jen Chen, Seong Chong Toh, and Wan Mohd Rauzy Wan Ishmail (2005), virtual reality was used to gauge student performance in respect to individual learning styles. The results of this study showed learners benefitted most from the VR guided experiences, regardless of learning styles (Chen et al., 2005). Also, technology is constantly evolving and VR experiences will continue to expand and deepen (Natchimuthu, 2009). In the classroom, this technological tool creates an engaging experience for all learners as well as providing them with the necessary knowledge to perform at the highest level (Pilgrim, 2016). In a study of high school students, Chen (2012) describes the importance of performance assessments in the classroom. Virtual Reality allows opportunities for varied assessments and topics of student interest (Chen, 2012).

Two key components of teaching instruction are prior knowledge and student motivation. VR software is a tool that enhances each of these components in specific ways (Pilgrim, 2016). Oftentimes, teachers must introduce experiences to students about concepts they may be unfamiliar with, which can lead to a hindrance in information acquisition. In 1928, Jean Piaget introduced the schema theory, stating that the brain tries to make connections to current
knowledge or understanding when learning new information. When students have no prior knowledge of a topic or concept, their brain is focused more on constructing new understanding of the concept rather than comprehending the information (Pilgrim, 2016). Also, when students are not knowledgeable or confident in a topic or concept, they are less likely to participate fully and perform at a high level (Pilgrim, 2016). When teachers provide experiences allowing students an understanding of prior knowledge, they are motivating students to create meaningful work and be engaged in learning activities (Pilgrim, 2016). This tool assists in the engagement aspect of lessons and can provide insight on topics that would not be possible for students otherwise.

According to Mayrose (2012), active and engaging learning activities providing meaningful experiences result in superior learning as opposed to passive ones. This tool can be used in a variety of settings and subjects such as reading, writing, science, and social studies (Pilgrim, 2016; Mayrose, 2012). Students are fully engaged and aware when using this software, which can greatly benefit their academic performance. Recently, virtual reality has been used in higher education across the globe to simulate medical procedures and present information (Natchimuthu, 2009).

**Procedures**

I implemented virtual reality headsets in writing lessons in order to improve my teaching of descriptive writing skills. I conducted this research over the span of ten days, within a two-week period. The first three days, informative writing was introduced and students participated in a writing activity. However, no virtual reality technology was implemented. On day four, virtual reality headsets were introduced to instruction and students were assigned specific location topics. On day five, students were given the headsets to use during writing research. On days six through eight, students used virtual reality headsets in small groups to research specific topics of their assigned location such as climate, geography, and culture. On days nine and ten, virtual reality tools were removed from instruction and students completed another writing activity.

During this ten-day study, my lessons focused on informative writing and students completed research assignments (see Table 1). On days one through three, I provided instruction and prompted students about descriptive writing through a writing activity describing different locations. On day four, I introduced the VR software and provided time for students to observe. On days five through eight, I implemented the VR software in small groups of four that aligned with their state research project and guided their observations towards specific attributes of each state. On days nine through ten, virtual reality was removed from the classroom and I obtained another writing work sample. Along with this writing performance data, I collected student behavior data to record how often they were reminded to stay on task. During the first three days, I observed and collected data. On days four through eight, I documented each behavior reminder on a chart that I created. Finally, on days 9-10, the number of reminders to get on task was collected as well.
I chose to collect writing samples from the whole class as data before and after the VR software implementation. Each writing sample was graded immediately after the writing was completed and a uniform descriptive writing rubric (see table 2) was used for every sample. Table 2 is the grading rubric which each sample was graded on.

Table 3 displays the results of the writing assessments given before and after the VR activities.

Behavioral data was also taken before, during, and after the VR software implementation. This recorded each time an instructor had to remind students to stay on-task or correct students for being off task. Table 4 displays the results of these data records.

Data Analysis

As evidenced by the charts in the tables above, students’ writing scores improved through using VR software. For the first writing sample, there were three students with the score of 4, five students with the score of 3, eight students with the score of 2, five students with the score of 1, and one student with the score of 0. For the second writing sample, after VR implementation, there were five students with the score of 4, eight students with the score of 3, eight students with the score of 2, five students with the score of 1, and zero students with the score of 0.

As well, their behavior reminders decreased significantly during the implementation of these lessons. Before the VR implementation, students were reminded to stay on task an average of 14 times per class period. During the VR implementation, students were reminded an average of 3 times per class period. Then after
the VR activity, students were reminded an average of 9 times in per class period. According to the data, both writing performance and behavior improved through this implementation.

**Conclusion**

After considering the data and results of this action research, it can be concluded that virtual reality experiences do indeed improve the effectiveness of descriptive writing instruction. The students showed improvement in descriptive writing skills and deeper engagement in the lesson activities. While not all writing grades improved drastically, and low scores still occurred, the number of high scores increased while lower scores decreased. They also required much less behavior management during the writing lesson activities including virtual reality experiences. These results potentially indicate the successful influence of virtual reality on instruction.

Importantly, these results may not be solely attributed to the implementation of virtual reality software. The first writing sample was obtained after three days of writing instruction on descriptive informative writing, while the last was taken after ten days of exposure to this writing. The improvement of writing scores may also be connected to student understanding of descriptive writing through review and exposure to nonfiction texts. As well, there is always room for error when using performance assessments for data because grading can unconsciously become biased. Also, for one day of the four-day VR implementation data collection, five students in the class were not present due to a Gifted and Talented program field trip. The smaller class number may have affected the requirement of behavioral reminders.

Regardless, the virtual reality software visibly enhanced instruction, student engagement, and student performance. The students were excited about this experience and made thoughtful observations about places they may never get to visit. I would use this methodology again because it was enjoyable for both the students and teacher and created an exciting and productive learning atmosphere in the classroom.

I would absolutely like to implement virtual reality software into my classroom for future instruction. There are uses for virtual reality beyond the subject of writing; I would be interested in taking virtual field trips or using it for scientific simulations. I hope to obtain a class set of Google Cardboard headsets to provide each student with one, rather than implementing in small groups like during my research. I highly recommend this methodology to all teachers, regardless of grade or subject, and see high value in this incredible tool. Virtual reality is an asset to successful education and should be harnessed for the opportunities it provides.

**References**


