The Effects of 3D Animated Movies and Interactive Applications on the Development of Visual Perception in 60-72-Months-Old Children

Seçil Yüceliyiğit, Ankara University, Ankara, Turkey
Neriman Aral, Ankara University, Ankara, Turkey

ABSTRACT

This study investigated whether the visual perception of 60- to 72-month-old kindergarteners attending a special program that included three-dimensional (3D) (stereoscopic) animated movies and interactive applications differed from that of children who attended only preschool. The sample included 62 children. Thirty received a training program including 3D animated movies and interactive applications every month for 5 months; for comparison, 32 did not engage in any special programs. Mann–Whitney U and Kruskal–Wallis tests were used to analyze the data. The results show that, on average, the visual perception of children who attended the training program was significantly better than that of children who did not.

Keywords: 3D (Stereoscopic), Animated Movies, Interactive Applications, Preschool Children, Visual perception

INTRODUCTION

Visual perception is the ability to interpret, analyze, and give meaning to what is seen. Visual perceptual processing rests on a set of skills used to gather visual information from the environment and integrate it with information from other senses. Visual perceptual processing is very important, especially during learning. In the absence of visual perceptual processing, many activities in human life (e.g., reading, giving or following directions, writing, visualizing objects or past experiences, remembering things visually, demonstrating eye–hand coordination, and integrating visual information with other senses to ride a bike, etc.) would be impossible.

DOI: 10.4018/ijopcd.2013070107
A very substantial part of the cerebral cortex of the human brain is reserved for visual processing. Different parts of the brain have developed to perform different tasks; these include seeing and perceiving color, depth, figure/ground, movement, and so on. Because the ability to see offers the advantage of providing information about the environment from a distance that is too great for the effective operation of touch, smell, and taste, vision is considered a superior sense and privileged among humans (Farrori & Menon, 2008). For this reason, visual perception, which forms the basis of cognitive development, plays an important role in the reading and writing skills of children and needs to be reinforced (Feder & Majnemer, 2007; Aki, Aral, Bütün Ayhan, & Mutlu, 2008).

Human beings have two eyes located side by side on the front of their heads. Each eye views the same area from a slightly different angle, and the two separate images are sent to the brain for processing. When the two images simultaneously arrive in the brain, they are united into one picture. The mind combines the two images by matching the similarities and adjusting for the small differences between them. These small differences contribute to a major difference in the final picture. That is, the combined image is more than the sum of its parts. Instead, it is a three-dimensional (3D) stereoscopic picture. The ability to perceive depth in a 3D presentation is a highly sensitive test of a range of indicators of visual health. It is much more sensitive than the standard eye chart that has been in use for years because 3D viewing requires that both eyes function in a coordinated manner as they converge, focus, and track the 3D image.

Graphical and visual applications initially relied on two dimensions. Subsequent developments added a third dimension, and virtual reality constitutes the last step in this evolution (Eden, 2007). The new generation of movies is presented primarily in stereoscope, and even preschool children are able to employ 3D vision. This study investigated the effects of 3D (stereoscopic) animations and interactive applications on the visual perception of preschool children. We expected that the interactive applications and 3D stereoscopic movies would simultaneously evoke the child’s audio–visual senses, integrate data from different sources, and require the sense of touch. Thus, these applications and movies would facilitate the development of cognitive skills such as those involved in evaluation and decision making, as well as visual perception. It has been reported that efforts to facilitate the ability of the five senses to experience and to use these experiences in daily life are critical for long-term learning (Murphy, 2009).

Recent studies have shown that the development of visual perception increases a child’s sensitivity to, and ability to integrate, information from diverse sources. Indeed, deficits in visual perception are associated with learning disabilities, hyperactivity, and problems with reading and writing (Solan, 1987; Mangur & Çağatay, 1987, Tseng & Chow, 2000; Aral, 2002; Ahmetoğlu, Aral & Bütün Ayhan, 2008). Several researchers have found a strong relationship between reading competence and visual perception defects (Griffin, Birch, Bateman, & Land, 1993), underscoring that poor visio–spatial ability is associated with language problems. To avoid or minimize academic and life difficulties, it is critical that children be presented with stimuli that are adequate to elicit the development of visual perception during their early years, especially during preschool, when visual perception starts to emerge (Akshoomof, 2006; Aral, 2010). It is in this context that complementary applications that make learning entertaining and interesting are required. Some applications, reflecting technological progress, render learning much more entertaining and interesting for children, starting as young as preschoolers.

Perceptual learning is accompanied by long-lasting and remarkable changes to the human perceptual system that improve the ability to respond to the environment. The use of multimedia tools such as animated movies enables students to learn via multi-sensory channels, which enrich and facilitate their learning process. Learning via animation is based on dual-coding theory. Animation addresses all
Related Content

Integration of Digital Primary Sources
www.igi-global.com/chapter/integration-digital-primary-sources/16744?camid=4v1a

Students' Perceptions on Distance Education in Ethiopian Higher Education: Exploring the Experience of Haramaya University
www.igi-global.com/article/students-perceptions-distance-education-ethiopian/74172?camid=4v1a
Designing Online Curriculum for Adult Learners
www.igi-global.com/chapter/designing-online-curriculum-for-adult-learners/106311?camid=4v1a

The Changed Role of Professor in Online Courses
www.igi-global.com/article/changed-role-professor-online-courses/61398?camid=4v1a