**ANIMATION AS AN EDUCATIONAL TOOL**

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Using computer animation as an educational resource for younger children, ages three through seven, can enhance their cognitive development. There are many different approaches and tools that educators use in teaching. Storybooks, animation, computer animation, and interactive videos are all visual tools that can assist in education. The value of using computer animation in aiding young children’s cognitive development will be analyzed in this paper.

Animation is defined as “a dynamic visual medium produced from static drawings, models, or objects posed in a series of incremental movements that are then rapidly sequenced to give the illusion of lifelike motion” (“Animation”). The various forms of animation have evolved throughout the years based on technological advancements in software and hardware and the mastery of techniques to create motion graphics. One of the forms is computer animation which is defined as, “a product of animation, created using computer hardware and software” (“Computer animation”). Cognitive development is “the construction of thought processes, including remembering, problem solving, and decision-making, from childhood through adolescence to adulthood” (“Cognitive development”). Educational animations are created for the purpose of making the learning more interactive and interesting—this can grab the attention of younger children. For the purposes of this paper, the focus will be on the use of computer animation as an educational tool in children’s cognitive development.

In thinking about education, we must also understand the impact technology has on young children. As stated by Richard Lowe and Wolfgang Schnotz, “recent advances in technology have provided a wide variety of possibilities for incorporating animation in computer-based learning environments. In a very general sense, the term ‘animation’ can refer to any display element that changes its attributes over time” (304). This can be as simple as a shape moving across the screen or as complex as using interactive   
two-dimensional or three-dimensional characters to tell a story. Technological advances have a major impact on the educational resources that are now available for students. Young children are exposed to technology very early on and their understanding of the use of technology sometimes happens naturally, without the aid of a teacher or parent. Many children’s toys simulate the use and functions of a computer, tablet, camera and smartphone.

It is necessary to focus on the fact that young children learn visually. Animation allows children to visualize a narrative. However, as stated by Richard Mayer, “not all pictures are equally effective. It is important to understand how best to incorporate pictures with words. Just because technologies are available that allow for state-of-the-art visualizations, this does not mean that instructors are well advised to use them. What is needed is a research-based understanding of how people learn from words and pictures and how to design multimedia instruction that promotes learning” (Introduction 6). This is something to be noted since many times the overuse of technology can be a hindrance as opposed to a benefit. The right balance of visual stimulation and static information is essential in achieving successful results, especially for young children. A thorough understanding of educational methods needs to be balanced with a thorough understanding of animation development.

In an article by Yvonne Rogers, she states “animation has been used in formal, informal, and playful learning context to facilitate comprehension, understanding and reflection in different ways. Much of the research to date has been concerned with its efficiency in an educational context, in particular, as a cognitive aid to facilitate the comprehension of difficult and complex subjects” (286). It is the aid in comprehension that benefits cognitive development in young children. These subjects vary depending on the child’s age. The rapid growth and development of children’s thinking abilities, use of symbols, language development and pretend play are critical during the preschool period, ages three through five. Memory also begins to develop through categorizing, reasoning and problem solving, usually around age three, and can be easily remembered as a child is actively participating and not just observing (Anthony “Cognitive Development 3—5”). This newly developed skill of active participation can be enhanced with interactive animated learning. According to Michelle Anthony, PhD, the timeframe between ages six and eight are critical in cognitive development in children. She states, “they move from being preschoolers into middle childhood, from a life dominated by fantasy to one that is beginning to be governed by logic and reason. They start to see themselves as more autonomous individuals, capable of basic independent problem solving” (“Cognitive Development 6—7”). As preschool children are developing these critical skills, they can apply them to subjects such as accepting cultural differences, understanding racial identity and biculturalism, to name a few.

Children learn from static images and animated images. There have been several studies that demonstrate the impact animation has had in education. In an eye-tracking study analyzing the benefits of animated versus static illustrations in storybooks conducted on children ages four through six, it was found motion captures children’s attention and is important in their understanding of the story. From this study, it was found that multimedia provides children with enhanced comprehension and word learning. The results found that “children recalled significantly more story language and recollected more similar stories to the original stories with the help of animated illustrations” and “the current findings corroborate the hypothesis that motion can elevate story comprehension and thus is a crucial part of a well-designed multimedia environment for children’s storybooks” (Takacs and Bus). The visual stimulation in the animated illustrations emulates the storytelling methods of animated shows and films. Younger children gravitate towards movement, bright colors, sound, music and characters, both fictional and non-fictional. All of these elements can be used within educational animation.

There are many benefits from using computer animation as an educational resource for young children. It seems “animation is playing a more and more important role in the classroom with the advent of computers. Some software companies have developed various production tools and resources for almost all disciplines or various professional trainings.   
For example, *GoAnimate.com* claims that its educational division has provided 2,500 schools with its animation tools since December of 2010” (Xiao). In addition to *GoAnimate.com*, there are many online resources that use computer animation as a teaching aid. One of these resources is *ABCmouse.com Early Learning Academy,* which provides a full online curriculum in reading, math and science for children ages two through seven. Additional online resources which use characters, games and videos geared towards children and promote digital learning are *nickjr.com*, *pbskids.org* and *kids.nationalgeographic.com*.   
These online resources use animation to teach reading, writing and math skills, that otherwise may be difficult for younger children to understand without additional visual interactive media.

Some studies believe that “traditional education is slowly moving away from   
pen-and-paper correspondence courses, allowing for a more interactive, integrated learning environment. The term ‘blended learning’ has gained considerable attention in recent years as particular forms of teaching with technology” (Islam et al). In particular, a study conducted at a primary school in Dhaka, Bangladesh using an integration of visual learning materials with teacher’s instructions – resulted in an exclusively high impact on improving students learning skills with the adoption of a blended learning system (Islam et al). Although many researchers believe traditional education will be completely phased out, their prediction may be a bit extreme. The complete elimination of traditional learning, such as the use of storybooks, would be extremely difficult to replace. However, over time, technology will advance and will be even more prevalent than it is now, especially within the classroom. Currently, many schools are testing out new technologies to enhance their teaching capabilities with the use of electronic devices, cloud computing and even 3-D printing. It should be noted that as technology advances and studies continue to show improvements in students’ learning and subject comprehension, the use of animation as an educational tool will increase and be more readily available.

In addition to providing a visual learning environment, animation gives objects character. These objects can be turned into actual characters to show emotion or diversity that allows young children to relate on a personal level. This personal connection to the storylines could spark an even further interest in children who may want to create their own original animations. In an afterschool program at the Fair Furlong Primary School in Bristol, UK, children are being taught to create their own animation in a series of after-school clubs. Teacher Vicky Cleeves runs the program and states, “the important thing [for me] about animation is the range of ability of children who can access it, irrespective of their level of reading or writing or anything else, they can express their thoughts and ideas in a visual format that everyone can respond to.” As a result of this hands-on-learning, children are developing a new skillset, creating their own storyboards, characters and learning the various steps in creating animated stories from start to finish.

The various levels of reading or writing, whether the skills have not been fully developed or are on track to being fully developed, should not be a deterrent from using animation or interactive media as a form of an educational resource. There is great potential for educators to use animation to teach students that may have difficulties expressing themselves and have not yet fully developed their reading, writing and language skills. Learning about subject matter visually, helps enhance the understanding of specific subject material that may be hard to teach otherwise.

As a visual artist and mother of a three-year-old, the use of animation as an educational resource to enhance cognitive skills within younger children really resonates with me. The use of computer animation, in addition to the use of traditional storybooks, as an educational resource provides a positive impact on cognitive development. Together, they become powerful educational tools for young children. My capstone project for the Master of Arts Digital Arts program at Goucher College focuses on the development of an original story and storyboard, the creation of an illustrated storybook and the production of animated characters to use in an animated video version of the storybook. More specifically, a narrative written for young children and an animated version that demonstrates the usefulness of the story’s animated characters to assist in teaching a cultural story focused on biculturalism. As a result of this research, it is confirmed that the use of animation has a positive impact on education, namely the cognitive development of younger children ages three through seven.

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