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What is the Impact of Computer-Assisted-Instruction on Mathematics Achievement in Elementary School Students?

In today's society, technology is an important tool in everyday life such as education, business, and entertainment. Computers are in the classroom and changing the way people learn. Integrating technology into the curriculum can enhance the way children learning and development. Also, it is a good tool for teachers can use for assessment.

The purpose of this study is to investigate the impact of computer-assisted instruction on early elementary academic performance in Math. Computer-assisted instruction is defined as "an interactive instructional techniques in which a computer is used to present instructional material, monitor learning, and select instructional material in accordance with individual learner needs" (Rice University, ERIC Thesaurus, 1966).

Review of Related Literature

Over the past few years, technology has an impact on leaning and instruction in the classroom. It gives children hands-on-experience and enhances their learning of math and other academic subjects. Flores (2002) states that technology can be used in the elementary grades to enhance a concrete, experimental approach to mathematical topics, enabling students to have greater success with a more symbolic, abstract approach later in school. The computer offers unique opportunities for learning through exploration, creative problem solving, and self-guided instruction. Cuban (1993) attributes technology's appeal to three factors: (1) the desire to prepare students for the transition into an increasingly technological workforce, (2) the potential for

computers to provide a vehicle for self-directed learning, and (3) the perception that computer use in the classroom will increase productivity (Lathman, 1999). Spencer and Baskin (1997) noted that despite the relatively new status of research on the effects of microcomputer use, the computer can be used as a tutor to present concepts, information, or skills normally presented through conventional teaching methods (Hitchcock and Noonan, 2000).

Many teachers use educational software as an instructional tool for the classroom. Young learners need to use software that teaches them how to work independently, explore, discover, learn and make choices (Murphy & Thuente, 1995). Computers can raise mathematics achievement for preschoolers and primary grade children. Indeed, the greatest gains in the use of drill-and-practice software have been in mathematics skills in the primary grades (Clements, 1987a; Clements &Nastasi, 1992, 1993). Technology-based learning resources that show the greatest gains in academic achievement are those that: are sequential, include student-performance guide branching to optimal difficulty levels, include embedded assessments, and can be operated more or less independent of a classroom environment (Cradler, 2003). In classes where we integrated technology into the curriculum, students' yearly average grades were satisfactory or higher, as were their ratings on the standardized countrywide exam (Davis, 1997, p. 51). Technology has become an integral part of most classroom activities and a powerful computational tool and information resource for almost all teachers and students (Feldman, Coulter, & Konold, 2000-01).

There are researchers that do not support educational technology. Many researchers feel that the use of computers is harmful to children's health. The Alliance for Children explains (2000), "Emphasizing the use of computers in childhood can place children at increased risk for repetitive stress injuries, visual strain, obesity, and other unhealthy consequences of sedentary

lifestyle. Some development experts also warn that increasing the time that children spend on computers, given the hours they already sit in front of televisions and video games, may contribute to developmental delays in children's ability to coordinate sensory impressions and movement and to make sense of the results. That could in turn lead to language delays and other learning problems" (p. 20).

"In fact, 30 years of research on educational technology has produced almost no evidence on a clear link between using computers in the early grades and improved learning" (Alliance for Children, 2000, p.24). Also, children are isolated from interacting with other children. Young children need to spend lots of time outdoors, and time in social interaction with teachers and other children. Computers threaten to displace the "normal" learning experience, as children redirect their time to computer activities that evoke ways of thinking that are age appropriate (Attewell, Garcia, Battle, 2003).

I believe that technology can enhance the learning of children in the classroom. Computers are being integrated into the curriculum more than ever. It is a tool that can help students with basic skills such as reading, writing, and math. With the support of professional development training, teachers can use technology to improve their own teaching practices.

Method

Participants

The participants for this study will be elementary school teachers and children in 3rd grade classrooms.

Instrument

- Questionnaires for school teachers (to see if they integrate technology into their curriculum)

- Math scores from standardized New York State Test

-Pretest/Posttest

-Educational Software/Websites

Design

-There will be a math pretest given to 3rd graders in September.

Data Analysis

-The scores of the 3 grade classes will be compared statistically.

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