Computer-Assisted Instruction: A Case Study of Two Charter Schools

Jared Keengwe, Department of Teaching and Learning, University of North Dakota, Grand Forks, ND, USA
Farhan Hussein, Lighthouse Academy of Nations, Minneapolis, MN, USA

ABSTRACT

The purpose of this study was to examine the relationship in achievement gap between English language learners (ELLs) utilizing computer-assisted instruction (CAI) in the classroom, and ELLs relying solely on traditional classroom instruction. The study findings showed that students using CAI to supplement traditional lectures performed better than the students relying solely on traditional classroom instruction. In addition, using CAI to supplement traditional lectures helped the charter schools to close the educational achievement gap of their students. Based on the findings, there is need for teachers to move past traditional learning, and learn new technology skills in order to incorporate sound technology-enhanced instructional strategies to support student learning.

Keywords: Achievement Gap, Computer-Assisted Instruction (CAI), Computer Technology, English-Language Learners (ELL), Schools, Student Learning

INTRODUCTION

English-language learners (ELL) consist of the fastest growing percentage of the overall student body (National Clearinghouse for English Language Acquisition and Language Instruction Education Programs (NCLEA, 2007). In 1979 to 2003, the ELL students increased by 124%, while other student populations increased by 19% (National Center for Education Statistics, 2004). It is also likely that the percentage of ELL students in American public schools will continue to grow. Additionally, ELL students are spread all over other several states in the nation (Capps, Fix, Murray, Ost, Passel, & Herwantoro, 2005; Flynn & Hill, 2005). About 8 out of 10 ELL students speak Spanish, but some districts have students who represent more than 100 different language groups (National Clearinghouse for English Language Acquisition and Language Instruction Education Programs (NCLEA, 2007).

While computer-assisted instruction (CAI) has provided a supplemental instructional method in schools for almost two decades, there is still debate on the importance of delivery systems and instructional methods. CAI generally refers to drill-and-practice, tutorials, simulation/interactive thinking, word processing, conferencing, and other activities (Fletcher-Flinn & Gravatt, 1995). Specifically, CAI consists of drill and practice, simulation tasks, instructional games, and tutorials; instruction can contain new material, and can be used alone or as an enhancement...
to traditional instructional methods (Bitter & Pierson, 1999; Cotton, 2001).

Computer use in the classrooms has boomed since the 1980s, fueling a debate over whether or not computer-assisted instruction (CAI) is an effective means of improving student achievement. CAI is one of the six best practices, which support literacy learning at the elementary school level (Drake, 2001). Proponents of CAI argue that there is a positive learning advantage for computer-assisted instruction when compared with traditional instruction (Fletcher-Flinn & Gravatt, 1995). Additionally, computer technology makes learning easier, more efficient, and more motivating (Schacter & Fagnano, 1999). There are many reasons that educators should put computer technology in ELL environment: a) It gives a practice time, b) It motivates students, c) It enhance student learning, d) It increase authentic materials that students can study, and e) It encourage team work between students (Lee, 2000).

In a meta-analysis of 500 studies, Kulik (1994) reported that CAI increased the positive attitudes of students toward learning, which resulted in increased learning. Similar to the findings of Niemiec and Walberg (1987), Kulik’s findings suggest that CAI is more effective in improving achievement of younger students and students with special learning needs. Students of lower socio-economic status benefit more from CAI than do students who are from a more advantaged environment (Cotton, 2001). The findings from a comparison study in motivation of elementary and intermediate level second-language students learning English through print revealed that CAI increases motivation for learning English in students whose primary language is not English (Garcia & Arias, 2000). Other findings suggest that students learning increased up to 40% faster through CAI instruction as this mode increases student time on task (Cotton, 2001). Further, CAI boosts positive attitudes of students toward learning.

In a study to examine the effect of computer technology on learning and achievement across all learning domains and all learner ages, Sivin-Kachala (1998) reported three major findings. First, that students in technology rich environments experienced positive effects on achievement in all major subject areas. Secondly, that students in technology rich environments showed increased achievement in preschool through higher education for both regular and special needs children; and finally, that students’ attitude toward learning and their own self-concept improved consistently when computers were used for instruction. However, he noted that specific student population, the software design, the educator’s role, and the level of student access to the technology affected the level of effectiveness of educational technology tools.

Interactive visual media that computers provide allow language learners opportunity to enhance their problem solving and interpersonal communications skills (Kozma, 1991). Further, computers can also enhance vocabulary development as well as verbal language development. The computer-assisted language learning programs can also be wonderful stimuli for second language learning. In a related study, Kozma (1994) noted that the medium and methods combine to interact with and influence how students learn and process information, and therefore, the media can be thought of as “a complementary process within which representations are constructed and procedures performed, sometimes by learner and sometimes by the medium” (Kozma, 1994, p. 11).

**PURPOSE OF STUDY**

The ratio of computer use in United Stated Schools has declined dramatically every year. The U.S. Department of Education (2005) reported that the ratio of students using instructional computers with Internet declined to the ratio of 3.8 to 1 in 2005 from 12.1 in 1998. Further, during the same time, Internet access increased exponentially. Generally, many schools today have computer technology resources in the classroom. However, having computer technology resources alone is not enough. According to Clark (1983), “the media are mere vehicles that deliver instruction but do not influence student achievement any more...
Related Content

Using Augmented Reality Technologies to Enhance Students’ Engagement and Achievement in Science Laboratories
Rong-Chi Chang and Zeng-Shiang Yu (2018). *International Journal of Distance Education Technologies* (pp. 54-72).
[www.igi-global.com/article/using-augmented-reality-technologies-to-enhance-students-engagement-and-achievement-in-science-laboratories/210667?camid=4v1a](www.igi-global.com/article/using-augmented-reality-technologies-to-enhance-students-engagement-and-achievement-in-science-laboratories/210667?camid=4v1a)

Emerging Trends in Skill-Based Education With MLearning and ERP
Manoj Shantikumar Kiledar and Chetana Hemant Kamlaskar (2018). *Optimizing Open and Distance Learning in Higher Education Institutions* (pp. 313-335).
Attitude of Undergraduate Students Towards Computer-Based Test (CBT): A Case Study of the University of Ilorin, Nigeria
www.igi-global.com/article/attitude-undergraduate-students-towards-computer/65576?camid=4v1a

Formative Assessment and Certification in Lifelong Learning with Cognitive and Metacognitive Measurements
www.igi-global.com/chapter/formative-assessment-certification-lifelong-learning/38404?camid=4v1a