



# Facilitating Students with Special Needs in Mainstream Schools: An Exploratory Study of Assistive Learning Technologies (ALT)

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## ABSTRACT

*Assistive Learning Technologies (ALT) have increasingly become pertinent in developing the technology literacy in education for supporting physically-disadvantaged learners in realizing their potential in the teaching-learning process. This paper reports on a multiple-case study that sought to explore the underlying mechanisms (i.e., the how and why issues) relating to the role of ALT in helping students with special needs to circumvent their disabilities and integrating them into the mainstream schools. It is found that the use of ALT enables the subjects to access the electronic learning environment, as well as improve their time management. The end result is that these students can perform their everyday (learning) tasks on par with their peers in school. The study has also unveiled moderating factors influencing the usage of ALT; examples are the ease of use of ALT, and the subjects' desire to enhance their academic and social competency.*

*Keywords: assistive technologies; case study; computer-mediated communication; educational technology; self-efficacy; technology mediated learning; user characteristics*

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## INTRODUCTION

By applying creativity to make computers easier for physically-challenged students to access, Assistive Technology creates an educational environment to foster self-development, cooperation, positive communications, and personalization of information. The education of students with disabilities can be made more effective by

ensuring access to the general curriculum to the maximum extent (Hager & Smith, 2003). Assistive technology offers new opportunities for handicapped students to participate fully in the classroom settings (Tomei, 2005).

An assistive technology device is defined as "any item, piece of equipment or product system whether acquired commer-

cially off the shelf, modified, or customized that is used to increase or improve functional capabilities of individuals with disabilities” (Technical Assistance to the U.S. States Act, 1988). Assistive technologies include computerized equipment but also simple magnifiers, splints, pointers, and ramps to offer disabled users the tools necessary to be more successful in school and at achieving independence in daily living. This study, however, focuses on studying the impacts of the *computer-mediated* hardware and software used by disabled students in a learning environment; we refer to these technologies as Assistive Learning Technologies (ALT). Some examples of ALT include modified or alternative keyboards, alternative input/output devices, touch screens, voice-recognition systems, graphic organizing software, special cognitive software, and so forth. ALT are powerful tools in supporting physically-challenged students with equal opportunities to more fully participate in the teaching-learning process (Hager & Smith, 2003; Lengyel, 2003). Through the use of ALT, many handicapped students are found to decrease their isolation and become an important part of a regular class (Cavanaugh, 2002).

Learner success has been found to depend on the ability to cope with technological difficulty and technical skills in computer operation (Pituch & Lee, in press). The meta-analysis conducted by Chang and Lim (2005) provides a framework which highlights the moderating effect of learner characteristics on the effects of learning technology on learner performance. User characteristics have been found to affect behavioral intention to technology usage (Venkatesh & Davis, 1996). Although many learner characteristics have been addressed, the dimension of disability has largely been ignored but certainly deserves attention

(Moody & Beise, 2003). Common definitions of disability focus on health conditions, limitations on normal activities, or perceptions of disability (Moody & Beise, 2003). ALT are a pertinent component in developing the technology literacy in the context of education. In this research, we seek to explore how and why ALT can help students with special needs circumvent their disabilities and integrate them into the mainstream schools. The paper addresses two research questions: (1) How do ALT help students with special needs achieve better learning performance? (2) Why do these students use ALT to help them in school work?

## LITERATURE REVIEW

### The Use of IT in Education

The use of Information Technologies (IT) in education is not a new phenomenon. IT not only bring exciting curricula based on real-world problems into the classroom but also provide scaffolds to enhance learning (Englert, Manalo, & Zhao, 2004; Hitchcock, 2001; Tinker, 2001). IT help to build local and global communities that include teachers, students, parents, and other interested individuals (Pea, 1993; Salomon, 1993). These technologies give students and teachers new opportunities for feedback, reflection, and revision. Moreover, IT expand learning opportunities for both teachers and students (Brandsford, Brown, & Cocking, 1999).

The following briefly outlines the use of Computer Mediated Communications (CMC), Computer Assisted Instruction (CAI) and Internet. The use of CMC can not only support and reconcile learning activities, but also assist or substitute conventional classroom teaching. In the learning process, CMC aid learners by removing the

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