EXPERIENCING THE REGULAR CLASSROOM CURRICULUM USING A NEW ACCESS TECHNOLOGY

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ABSTRACT
What happens to a nine year old student with cerebral palsy and severe communication disorder when engaged in using an assistive technology for communication? Specifically, does academic learning behavior include being able to access the regular school curriculum alongside peers in a mainstream classroom setting? After six months, results indicate significant progress and also identify several challenges when attempts are made to design and provide a student with severe disabilities such opportunity. Issues around ownership of academic planning, time for staff to consult, providing opportunities for staff to address important program technology issues and development of strong parent relationships along with the need for a plan that allows for administrative monitoring and oversight are some of the findings discovered thus far.

KEY WORDS
curriculum, access technology, mainstreaming, disabilities, Camera Mouse, cerebral palsy

1. Introduction

Development of appropriate educational programs that design specific instructional strategies to address specific learning needs is a challenge for educators when confronted with students with severe physical and communication disabilities. Beginning in September, a nine year old female student (please see Figure 1) with cerebral palsy and severe communication disorder was transitioned from a full time children's rehabilitation center into the public school that she would normally attend in her community. The student has been using an access technology that allows her to control the mouse pointer by moving only her head. She can not speak and has limited voluntary muscle control from the neck down. As a result of her demonstrated proficiency in using the access technology both at home and at the rehabilitation setting a decision was made to transition the student into a regular public school in her neighborhood.

Figure 1. The student.
(Picture used with permission.)

Based on available information from center staff, parents and observation impressions made by select members of the receiving school, the student was placed in a 2nd grade classroom with the thought being that this classroom would represent an approximate peer group for her. A special education teacher and an aide were assigned to work with her during the school day.

Mother had been a strong home teacher and many of the things that the child has learned can be attributed to home teaching. It was determined through informal academic assessment that she could function adequately in a second grade classroom.

As a nine year old commencing formal schooling assigned to a second grade classroom it is estimated that she remains two academic years behind her age/peer group. Her placement in a more normalized school environment is consistent with evidenced based research that has been reported in the literature regarding meeting the educational needs of students with disabilities.

2. Background

Beukelman and Mirenda [1] categorize four levels of academic participation when students with disabilities are placed in a regular education classroom. The levels are Passive, Involved, Active Participation and Competitive Participation.

1) At the Passive level placement there are no academic expectations and the student passively observes learning activities as a spectator.

2) At the Involved level the academic expectations are minimal and inclusion occurs via alternative activities.

3) At the Active participation level the academic workload is adjusted and evaluated using individualized standards.

4) At the Competitive participation level the student with a disability has the same expectations as the non-disabled peers.

3. Questions

Expectations for this student are at the Competitive participation level. The special education teacher and instructional aide are responsible for providing specific modification and accommodation supports of the classroom learning activity requirements.

To study the student's placement in the classroom the major question explored has been as follows:

To what extent does the use of access technology that allows a student to control the mouse pointer by moving only the head affect learning and teaching behavior?

Some additional questions have been:

What happens to the individual's communication skills?

What happens to the student's emotional development?

What happens to the student's social development?

What happens to the student's educational progress?

What happens to the student's home life?

4. The Student

The student in this study is a nine year old female who experienced the onset at 10 months of age of a condition that caused a period of acute deterioration of the white matter in her brain, resulting in her current motoric impairments. She is wheelchair bound with reflex influenced upper extremity movements. The student was referred to our Boston College program by an assistive technology professional who stated that the student‘s strongest mode of communication and most accurately controlled part of her body are her eyes and head. Prior to our seeing her, several eye gaze technologies were used with her including infrared systems and an eye gaze communication board.

5. Access Technologies

We have developed two computer access technologies at Boston College.

EagleEyes [2, 3, 4] is a technology that allows a person to control the mouse pointer on the computer by moving her eyes. EagleEyes works through five electrodes placed on the student’s head that sense the angle of the eyes in the head.

Camera Mouse [5, 6, 7] is a technology that allows a student to control the mouse pointer on the computer by slight movements of the head. Camera Mouse uses a standard video camera to track the movement of any distinguishing feature on the head (for example the corner of the eyebrow or the cleft of the chin) and move the mouse pointer accordingly.

With both technologies, mouse clicks are specified using dwell time. That is, if the user holds the mouse pointer at a spot on the screen for half a second a mouse click is generated by the software.

We allowed the student to try both technologies. She could move her eyes and she also had sufficient control of her head. So either technology would work for her. Camera Mouse is in general much easier for people to learn and the student quickly became skilled with it.

A Camera Mouse system was secured for the student to use at home with a second system secured for the student to use in the rehabilitation program that she was placed in at the time. In September 2002 the student was transitioned to the public school that she currently attends.

6. Results to Date

In December 2003 a representative team from Boston College spent a day visiting the program in which the student is enrolled. The purpose of the visit was to review the student's progress while enrolled in the 2nd grade classroom. The team met with the student, teachers, aides, speech therapist, technology specialist, building administrators, central office leadership and the student's mother. Information through interview, conference and observation both individually and in group was gathered in five areas that included communication, social, emotional, academic and quality of life aspects. While results to date are less than complete there are however, several findings and trends that appear worthwhile to report at this time.

From observational and other clinical impression sources a very positive picture is developing concerning the student's progress in the current placement. As noted earlier several questions have been the focus of study during the past six months. In the areas of communication, social and emotional development, educational and home life conditions there is evidence to suggest that positive gains have been made. For instance in the area of communication, the student has created a message using her access technology that she sent to her peer. (Please see Figure 2.) The message offers insight and is an example of an academic work sample that is reflective of the student's academic progress and status with a peer.

Figure 2. A note spelled out by the student using the Camera Mouse access technology and custom spelling software.

The spelling software being used is custom-developed. It divides the alphabet into five groups. The student selects the group. Then a screen appears with the letters within the group. So each letter selection requires two clicks. There also are buttons for space, delete, and for speaking the message aloud. The advantage of the program is that it allows the student to be less accurate with the access technology.

In terms of the student's social life, teachers reported that the student had numerous friends and was well liked by her peers. It was also reported that the student regularly demonstrated two vital learning behaviors -- being compliant and willing to follow directions -- that evidence based research indicate teachers rank highly.

As for the student's home life there is lots of observational evidence reported by school professionals that project it to be strong and vibrant. Mother's presence as the home teacher with specific areas of instruction has remained an important part of the student's success. The professional staff that work daily with the student speak with high praise for the cooperation and support that is provided them in their efforts with the student. There were several areas however that were identified as in need of assistance as the student's program is further reviewed, refined and developed. These are discussed below.

7. Discussion

The areas identified requiring serious attention to further ensure appropriate opportunities for the student included a need to clarify ownership of the academic program planning aspects of the classroom activities, providing time for teachers and support personnel to meet regularly for planning and review, professional development resources that allow personnel to continue to build strong collaboration among school and family members, and administrative attention to developing oversight and monitoring of the program. This latter issue serves not only to provide a vehicle through which program evaluation takes place but also serves as a way for all involved to become increasingly informed and skilled in addressing future needs of other students in similar circumstances. While there is much more to be done, academic expectations for the student have become increasingly clearer with a focus on being a competitive participant rather than a spectator.

Note: The Camera Mouse technology has been licensed by Boston College to CM Solutions, Inc. (www.cameramouse.com) of Austin, Texas. James Gips has a minor financial interest in the company.

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[7] www.cs.bc.edu/~gips/CM