Adapting Tablet PC Technology as a Support for Students Who are Deaf or Hard of Hearing

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Overview

- Description of research
  - Grants
  - Goals
  - Rationale
- Demonstration of technology
- Lessons learned
- Questions and answers

Research Grants Funded

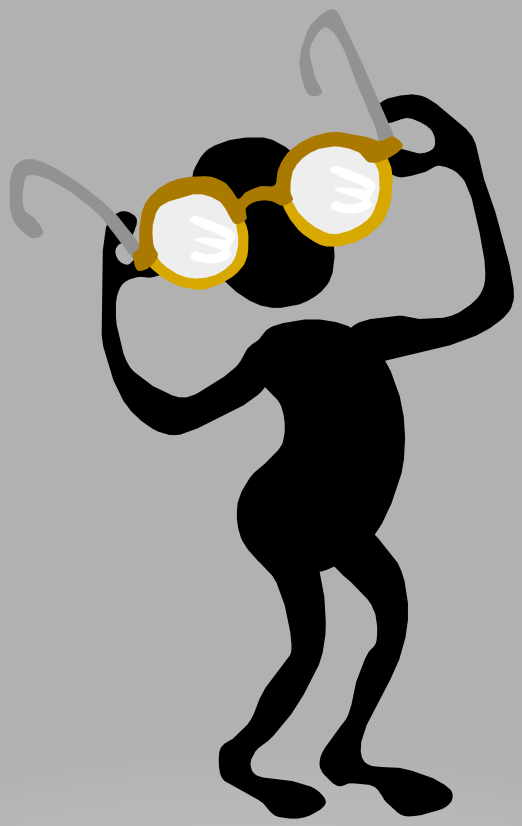
- Using a Tablet PC and C-Print to Support Deaf and Hard-of-Hearing Students
  - U.S. Department of Education, 09/05-08/08
- Evaluation of the Use of Tablet PCs and C-Print to Support Deaf and Hard-of-Hearing Students
  - U.S. Department of Education, 09/07-08/10

Challenges in STEM Classes

- Students with hearing loss experience challenges in STEM classes due to:
  - Popular teaching strategies in STEM classes
  - Properties of standard laptop computers
  - Available speech-to-text software created to capture verbal exchanges

Research and Development Goals

- Implement two options for using tablet PCs to provide support services for deaf/hard-of-hearing (d/hh) students
  - Provide real-time notetaking support (handwritten)
  - Provide graphic information along with a real-time display of text



A Quick Look

Initial Research Study

- Using a Tablet PC and C-Print to Support Deaf and Hard-of-Hearing Students
  - 15 deaf/hard-of-hearing students participated in the initial study; as well as their classroom teachers, itinerant or resource teachers, and C-Print captionists or notetakers
  - All students were enrolled in general education classrooms
  - 5-week trials

Student Characteristics

Real-time Notetaking Trials

						Additional Support Services Received Prior to/During Trial			
Sub #	*Sex*	*Grade*	*Read Level*	*Btr Ear HL*	*Course*	*Interp*	*Note-taker*	*FM*	*C-Print*
001	M	7	7.9	M→Sev	Science	√		√	
002	F	10	>16.9	Mod	Chemistry		√	√	
003	F	10	8.6	Mild	Geometry		√	√	
004	F	8	13.7	Mod	Math		√	√	
005	F	9	15.5	Mod	Math			√	
006	M	7	6.9	M→Sev	Math		√	√	
007	F	11	5.0	Sev	Algebra	√	√		

Student Characteristics

Tablet C-Print Trials

						Additional Support Services Received Prior to/During Trial			
Sub #	*Sex*	*Grade*	*Read Level*	*Btr Ear HL*	*Course*	*Interp*	*Note-taker*	*FM*	*C-Print*
008	M	8	12.9	Sev	Math	√	√	√	
009	F	7	9.0	Prof	Science	√	√		
010	M	11	16.2	Mild	Math				√
011	M	11	>16.9	Mod	Pre-Calculus				√
012	M	7	13.3	Mod (CI)	Science	√	√		
013	F	11	>16.9	Mod	Pre-Calculus			√	√
014	F	10	7.1	Mod	Algebra				
015	M	11	6.9	Mild	Chemistry				

Student Feedback

Student describes her usual experience with the pen-and-paper notetaking service:

"Well, from the notes on the paper, the way you get them at the end of the day, we have no idea what they wrote. If you see that they wrote something it is kind of like, you don't need that. Well not that you don't need it, but like but if they like didn't get something that you really, really needed, and like, later that night and you need to know what it is but you didn't get to write it down yourself, you might look back on the notes and it is not there and is really frustrating."

Student Feedback

Student comments on her experience with the tablet captioning with graphics:

"I thought that was really cool! It was like a mini version, and I was writing on it and um, I like seeing C. (captionist) writing on the teachers notes and then that way I can add to them myself, and also when I got the notes at home I could have my own notes but I could have C.'s notes too. "

Preliminary Results

Teacher Ratings of Student Performance During Tablet Trial As Compared to Student Performance Without Tablet

Sub #	Much less than avg performance	Less than avg performance	Avg performance (no difference)	Better than avg performance	Much better than avg performance
001	**A**			**V**	**P**
002			**AVP**		
003					**AVP**
004			**V**	**AP**	
005			**VP**	**A**	
006			**AVP**		
007			**AVP**		
008			**V**	**AP**	
009			**V**	**A**	**P**
010				**AVP**	
011			**AP**	**V**	
012			**A**	**VP**	
013			**AVP**		
014			**V**	**AP**	
015			**V**	**AP**	

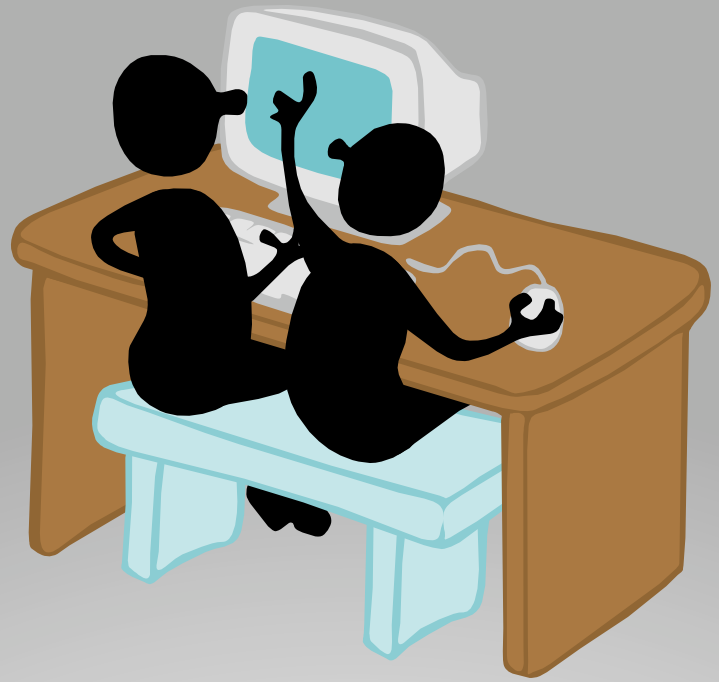
A= Academic Achievement V= Learning New Vocabulary P= Class Participation

Teacher Feedback

Teacher comments about change in student behavior related to class participation during trial:

"Yeah, in terms of her participation, she is a very strong student to begin with and she obviously takes pride in her work. But it seemed like her participation now is less on, "I don't understand this", but more on "I just want to repeat and want clarification". So her participation though, may not have improved in terms of how many times she was speaking out, but the information she was presenting to the class was more on target than before."

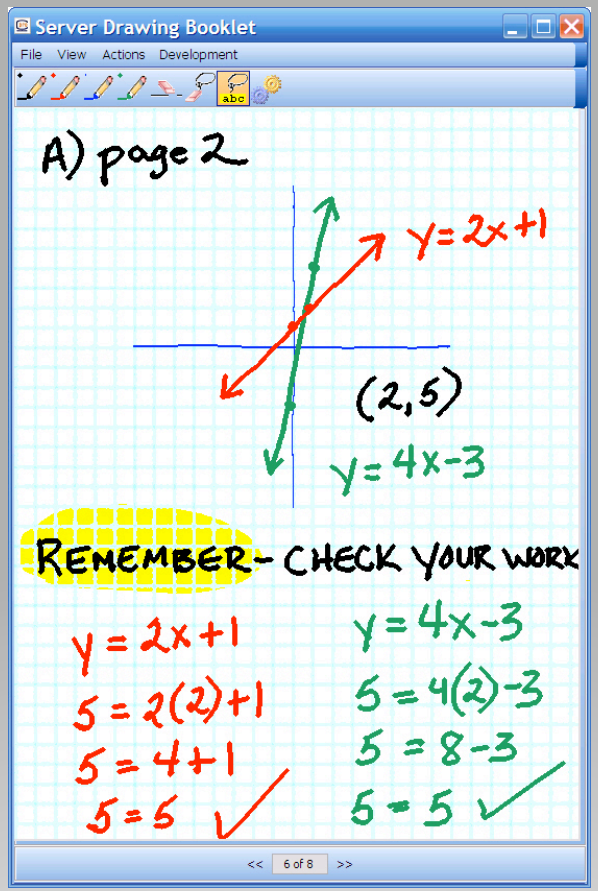
Demonstration



Common Features

- Tablet PCs
- C-Print Pro™ tablet software
  - Allow a range of ways to produce information, from text to drawing
  - Different from previous version of C-Print Pro software and other speech-to-text services that produce only text
- Notes distribution
  - Can be distributed in various formats (i.e., .html, .pdf, .doc)

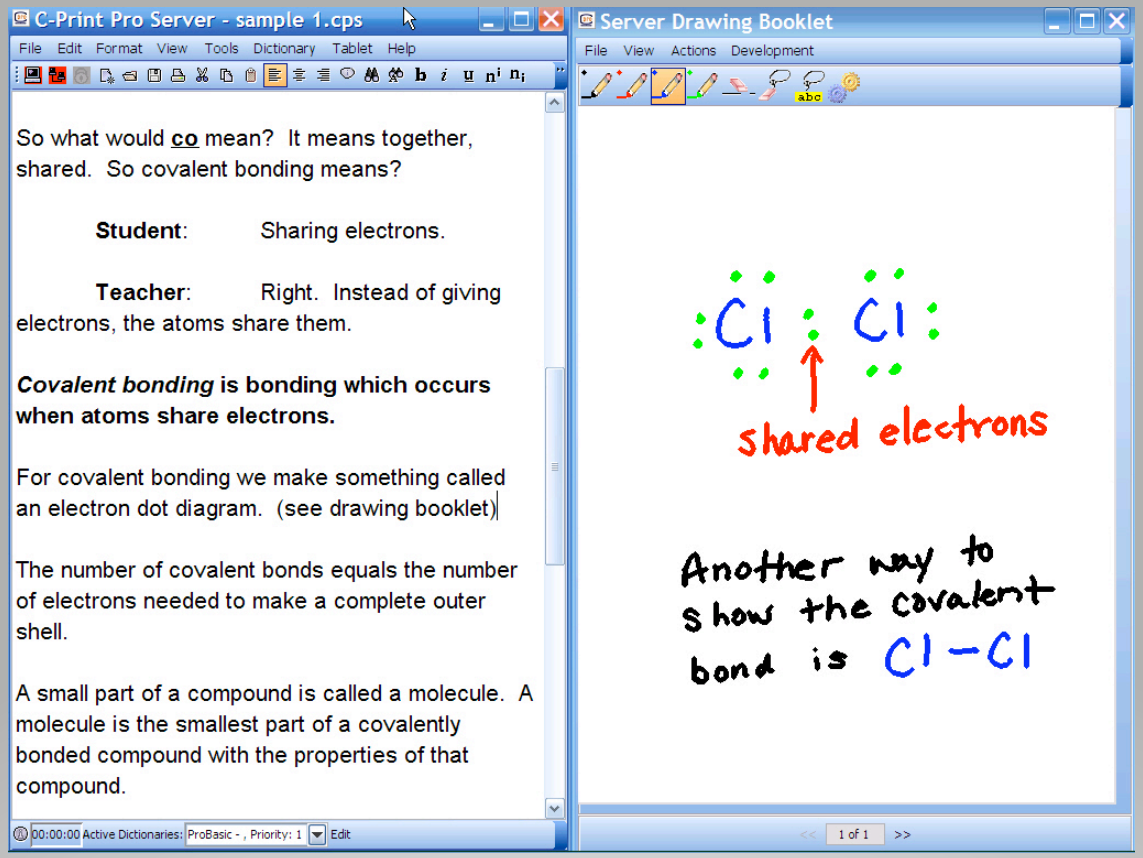
Real-time Notetaking



Impact on Role of Notetaker

- Become more familiar with technology
- Be more “synchronized” with presentation of information
- Write clearly/legibly
- Interact with students
- Manage schedule demands

Speech-to-Text with Graphics



Impact on Role of Captionist

- Manage multiple sources of input
- Become more technologically “savvy” (more training)
- Encourage student to self advocate and be more involved
- Facilitate more of a team approach with classroom teachers and students
- Adapt editing process and distribute files differently

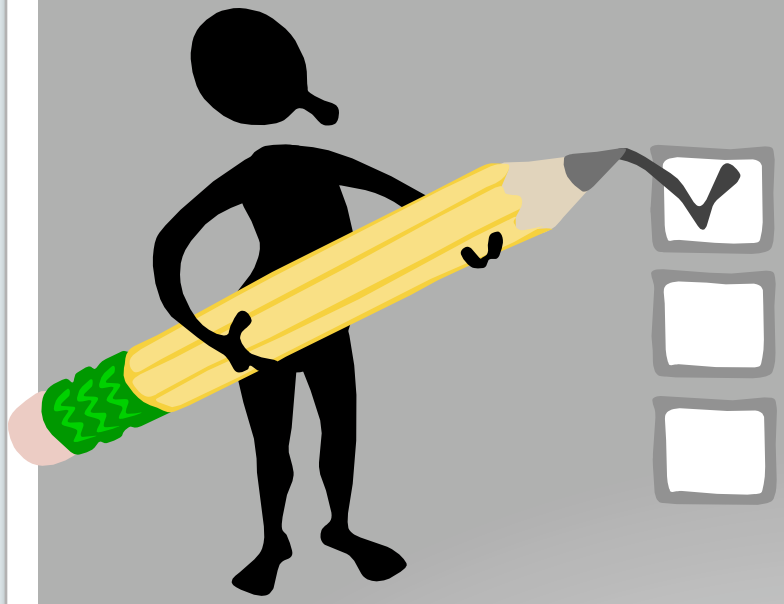
Student

- Taking notes for themselves
- Communication with service provider
- Adapting to new technology
- Individualized

Impact on Role of Student

- Develop comfort level with technology
- Interact with service provider
- Manage visuals (what to look at and when)
- Get training/support for notetaking skills and use of notes after class

Conclusion



- Research
- Technology
- Lessons learned
- Questions and answers

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Thank you
for attending
our session!