OVERVIEW

The Smartxt Universal Learning Program (SULP) integrates assistive, multi-sensory technologies into mainstream community college classes to accommodate DSPS students without putting additional stress on already overstretched budgets and services. With a focus on serving DSPS students in math classes, the Pencast Math Pilot Project was initiated in July 2011, to run through the 2011-2012 school year.

This pilot project focused on collaborating with math departments to integrate the use of one technological tool, the Livescribe Smartpen. The Smartpen was selected for math classrooms to support DSPS students, specifically, with the added benefit of supporting unidentified students with learning disabilities, and all students, in general.

Using the Smartpen, selected student note-takers took class notes while capturing associated audio from the instructor and students--- everything that was written and heard was taken in simultaneously by the computerized pen. These special notes were then uploaded as "Pencast" videos by the mentor for all students to use from any computer with Internet access. Instructors also made practice tests with answers worked out using the Smartpens.

This Pencast Math Pilot Project included student mentors and student note-takers as essential personnel to support mainstream math instructors and students. Instructors, mentors, and note-takers received training and on-going support from the SULP director, Stacey Kayden.

Livescribe Smartpens were distributed to thirty-one math instructors and notetakers at nineteen different colleges.

DATA COLLECTED

This final report of the Smartxt Smartpen Math Pilot Project includes data collected from both online and paper surveys of students, instructors, and mentors. It represents the best overview available of 168 student, 14 student mentor, and 13 instructor participant responses to questions collected between February 25, 2012 and April 14, 2012.

The instructor response rate is 45% (13/29) and the mentor response rate is 88% (14/16). As a result, we are reasonably confident that the responses received reflect a good sample of opinions, thoughts, and feelings of the project participants. We do not have available to us the full number of student participants to establish a response rate, but we can safely surmise that it is high as a result of concerted efforts to increase response

rates using well-documented methods to collect data by project staff, student mentors, and instructors. The sample we are using to review data was not selected randomly, and therefore no assumptions should be made based on that model of interpretation of data.

It should be noted that this assessment is not a summative assessment/evaluation of the Smartxt Smartpen Math Pilot Project, but a formative assessment for the purpose of assessing the project's strengths and weaknesses at the present time, and to make adjustments, if possible, based on the collected data.

Student, Mentor and Instructor Surveys were submitted from the following Colleges: Cerritos, Cerro Coso, College of Alameda, College of the Siskiyous, Diablo Valley, Fullerton, Laney, Los Angeles City, Los Angeles Harbor, Monterey Peninsula, Riverside, Santa Ana, Santiago Canyon, and Skyline. Courses include Math Fundamentals, Pre-Algebra, Algebra 1, Elementary Algebra, Intermediate Algebra, Statistics, and Calculus.

At the end of the semester, some students, instructors, and mentors completed online or paper surveys. Technical problems and end of semester workloads precluded adequate participation in the end of semester survey. What little was retrieved, however, supported earlier findings, but provided little in the way of new information. Anything deemed reporting is included below in this report.

HIGHLIGHTS

Student Mentors

To keep mentors informed, engaged and active, the project developed a tiered support network. A student mentor supervisor was hired to serve as a liaison between the project director and the mentor program. The mentor supervisor oversaw the next level of lead mentors who oriented newly recruited mentors at new campuses. She also managed the general state-wide mentor program.

The lead mentors maintained regular contact with new mentors and trained them on how to take Smartpen notes and upload them to the Internet. Additionally, each mentor was encouraged to add weekly notes to the group Google doc. Because of this doc, each mentor was able to see what the others were doing, how instructors and students were responding, and what challenges and success other mentors were having. Mentors also participated in a weekly online meeting hosted by the mentor supervisor. Comments posted on the Google doc were often the subjects of discussion for these meetings.

Instructor Training, Support, and Networking

In addition to the in-person support provided by mentors, course instructors were offered over thirty hours of online training and support by the project director. The focus of this aspect of the program was to familiarize instructors with the project goals and objectives, to discuss what was working for other instructors, to learn how to use

the Smartpen to best student advantage, to figure out technological challenges, and to provide guidance on posting and publishing Pencasts. These sessions also allowed instructors to problem-solve and share amongst themselves.

San Francisco Bay Area Sharing

The Smartxt Universal Learning Program was invited to host a Bay Area Regional Knowledge Exchange webinar on the use of Smartpens in college developmental math classes, on April 13, 2012. Included in the presentation was Stacey Kayden, Laney College, on an overview of using the Smartpen in college classes; Christine Will, Laney College, on using a Smartpen with a document reader; Myrna Sotelo, Cerritos College student, representing the student perspective; and, Larry Perez, Saddleback College, on diagnosing student needs with Smartpens.

Impact on Other Programs

As a direct result of the Pencast Math Pilot Project, Cerritos College Veterans Services used the notetaker model established by the project for the benefit of veterans in math classes. Two students that were given Smartpens though the Veterans Services listened to the audio notes through their car radios on their commutes home from school. While this was not one of the suggested uses, it shows that users can find benefits that fit their circumstances and time availability.

Livescribe Partnership

In Spring 2012, Livescribe partnered with the Pencast Math Pilot Project and generously provided 100 Smartpens to faculty and students statewide. This gift was then extended by the Office of the Chancellor of the California Community College, which agreed to purchase 50 more pens for the Fall 2012 semester. Over half of students in one class said that they are interested in purchasing a pen of their own after their experience with it in class.

FUTURE DIRECTION

With continued funding for the 2012-2013 school year, The Smartxt Universal Learning Program anticipates making the following positive changes to the Pencast Math Pilot Project:

Increased Access to Smartpens

SULP will purchase 50 additional Smartpens to increase distribution to California Community Colleges math instructors with the primary intention of providing students with disabilities access to class math notes as Pencasts.

Instructor Recruitment

Working closely with DSPS staff, the Pencast Math Pilot Project will recruit math faculty from colleges around the state to join the project. For the Fall 2012 semester, the

SULP director will provide promotional material via the HTCTU listservs and up to three Livescribe Smartpens per campus.

Lunchtime Webinar Orientation

Newly recruited math faculty will be required to participate in an orientation session on how to use the Smartpen, best practices in note-taking for Pencasts, and how to collaborate with student mentors and note-takers. Upon completion of the orientation session, and signed agreement to participate, instructors will be given a free Smartpen and offered ongoing training and student mentor support.

Instructor Advisory Group

A clear finding from the surveys and discussions with instructors, mentors, and students, is that a significant number of students did not use many Pencasts despite their stated belief that these instructional assets are helpful. To address this gap between belief and practice, the project will recruit instructors to problem-solve as a group on how to motivate more students to use Pencasts as a study tool.

A concern raised in the final surveys is how the occasional student notetaker or mentor might focus on note-taking or student and instructor support services to the detriment of his/her own studies. This advisory group will address how to provide the guidance necessary to prevent such occurrences.

Email Option

A number of students indicated that they would be more likely to make use of Pencasts if they were reminded about them and sent a link by email at the end of each class. The project will explore implementing this practice with instructors, mentors, and/or note-takers.

Support Videos

Some mentors expressed the need for ongoing support on the technical issues of using the Smartpen along with publishing notes. There were also concerns raised by both teachers and students on how to create the most useful Pencasts. In response, the Pencast Math Pilot Project is creating support videos for both student mentors and instructors. These videos will include how to best capture sound in a classroom, how to take good math notes tailored to Pencasts, how to upload notes efficiently, and how to foster mentor and note-taker collaborations with instructors.

Pencast Libraries

In an attempt to make Pencasts easier for students to access, The Pencast Math Pilot Project is currently developing two libraries that will be posted on the Smartxt Universal Learning Program website. The first library is for the current semester and lists Pencasts by college and class, and the second library is a general/cumulative library with Pencasts listed by subject. These libraries will be dynamic, in that they will be constantly changing and growing throughout each semester.

<u>Online Training Sessions</u>

Monthly, as well as on an "as needed basis," online support and training sessions will be offered to participating faculty, mentors and student note-takers. These events are for the purpose of reviewing and resolving technical problems, instructional dilemmas, Pencast publishing challenges, and other concerns that arise during classroom implementation of the Pencast Math Pilot Project

<u>Technical Issues</u>

Technical problems related to the Livescribe Smartpens and the Livescribe website have been shared with project contacts at Livescribe.

SUMMARY COMMENTS FROM THE PROJECT DIRECTOR, STACEY KAYDEN:

"Smartxt Universal Learning Program student mentors, the majority of whom are DSPS students, readily took appropriate ownership of the Smartxt Math Pilot Project by becoming trainers, leaders, and the inspiration of the program. Not only did these students support the overall college community, they built self-esteem and job skills through their leadership positions, group collaboration, communication building, accountability, faculty and student training, and technology skills.

"I believe that anonymous mentor and student comments gleaned from the surveys say the most about what the program means to these participants. Statements such as these tell the real story:

> • 'I don't always understand or remember what my own notes mean. Pencasts has helped me review my own notes. Also, listening to the lecture over again, has helped me better understand the material.' (student)

> • 'At times I may not completely understand how to do a specific problem and then by the time I get home I have forgotten. With the aid of the "Pencasts" I can go on line and listen to the teacher over and over as many times as I need.' (student)

> • 'By explaining to someone else-you learn, or engrave it into your mind." (student mentor)

> • 'I have been able to learn by teaching, by reinforcing good notetaking skills, reinforcing good study habits and peer sharing opportunities, as well as the fact that I have learned and utilized this great new technology to "re-hear" lectures of the week during the evening and weekend homework sessions.' (student mentor)

> • 'I bought my own pen (and one for my daughter, a student) at the beginning of the program. We have both benefited from having them.' (student mentor)

"Instructor feedback has been essential to the functioning and design of this project and we are grateful for so much participation. Key comments follow:

- 'One student took the class before a few times without success, now earned a B in the class. She claims the notes online helped her pass the class.'

- 'A handful of students keep talking about how glad they were that they could pay more attention in class and not have to worry about the notes. Even the rest that did not talk about it; I noticed they went to view the lectures based on their comments in class.'

- 'The benefits to me was that I did not have to worry about the notes during the class time. The mentor did an amazing job. But, it hurt her learning in the class because she wanted to do the best notes ever that she could not pay attention and understand. It affected her grade too much for my liking. The rest of the students were so happy that they could go back and review the notes even before a test.'

"I am looking forward to this next phase of the Smartxt Universal Learning Program Pencast Math Pilot Project. We have the opportunity to improve upon and continue to expand a project that is clearly benefitting students with learning challenges, as well as instructors, in key courses of community college mathematics. I am thrilled that participants have felt free to pass comments on having to do with both successes and areas of challenge; this helps us continue to alter the program to best meet stakeholders' needs.

"Our hope is that sometime in the near future we will have the resources to conduct a research study on the positive effects of using Smartpens in math classrooms. Until that time, we will continue to explore how to use this technology to the best advantage of DSPS students."

SURVEY DATA

Students (N=168)

Student Beliefs

- 108/168 (64%[*]) responded that they think that the Pencasts help them feel more confident as a math student
- 116/168 (69%) responded that they think that the Pencasts are helping them learn math?
- 126/168 (75%) responded that they think that the Pencasts will help them get better grades on homework and tests.
- 110/168 (65%) responded that they like the Pencasts (practice tests, sample problems, and classnotes).
- 75/168 (44%) responded that they think that the Pencasts are necessary for them to complete their math course.

Student Participation

52% of the portion of students (125) students answering a question about how many particular Pencasts they have viewed, state that they have watched between 2 and 5 Pencasts so far.

* All percents are rounded to nearest whole percent

Student Comments

We solicited comments for many questions in an attempt to understand reasons behind particular responses. Not surprisingly, many comments about why students like and dislike Pencasts are similar and revolve around the following common sentiments:

1. Great for when I miss a class, so I don't fall behind
2. Great for review/as a refresher.
3. Great for when content in class goes by too fast.
4. Great as a way to supplement or correct my own notes.
5. Like that I can view it as many times as I want.
6. Helps me clarify information.
7. I have not used them yet, but they seem like a good thing to have.
8. It's useful but hard to access if you don't have a computer.
9. I don't know how to get to the website/hard to find my classnotes on the website.
10. Audio is sometimes out of synch/of poor quality/takes too long to load.

Mentors (N=14)

Mentor Beliefs

- 12/14 (85%[*]) responded that they believe that they are becoming better students
  because they are a mentor
- 12/14 (50%) responded that they think their computer skills have improved as a
  result of being a mentor.
- 14/14 (100%) responded that they like their role as a mentor.

Student Participation

The ways in which mentors are assisting students and teachers varies from course to
course.

- 14/14 (100%) responded that they made Pencasts of class lessons.
- 6/14 (43%) responded that they are helping a designated class note-taker with his or
  her class notes.
- 13/14 (93%) responded that they upload the class note-taker's Pencasts
- 5/14 (36%) responded that they help the instructor upload notes that he or she
  creates

* All percents are rounded to nearest whole percent

Comments About Mentor Role

1. Helps me to take good, complete notes.
2. I get to help others.
3. I love seeing others succeed.
4. Meeting and working with others may not have happened otherwise.
5. Google docs are very useful for keeping in touch, being apart of a group, and hearing
   others' experiences.

Comments to Mentors from Students

1. Helped me score 98% on an exam.
2. Viewed the notes with my high school daughter learning the same thing.
3. Where can I get a Smartpen?
4. It allows me to concentrate on the lesson and not on note-taking.

Other Comments

1. Good note-taking skills are necessary.
2. The pressure to take good notes "adds to the nerves."
3. Students don't "get" that they need to do whatever it takes to do well.

Instructors (N=13)

Instructor Participation

- 10/13 (77%[*]) responded that they posted 2-3 practice test Pencasts
- 1/13 (8%) responded that they posted 6-7 practice test Pencasts
- 8/13 (62%) responded that they do <u>not</u> do sample problems as separate type of Pencast
- 4/13 (31%) responded that they post 10 or more sample problem Pencasts
- 10/13 (77%) responded that they had 10 or more student produced classnotes Pencasts uploaded.
- 11/13 (85%) responded that they anticipate wanting to use the Smartpen again next semester.

* All percents are rounded to nearest whole percent

Pencasts are made available to students primarily through a Word doc. Some instructors have made them available in other ways.

- 5/12 of respondents indicated they use their own class website .
- 1/12 of respondents indicated they use Math XL.
- 1/12 of respondents indicated they use MyMathLab.

Instructor/Livescribe Pen Ease of Use

- 5/11 (46%) of respondents indicated that the Livescribe Pen is somewhat easy to use.
- 4/11 (36%) of respondents indicated that the Livescribe Pen is very easy to use.
- 2/11 (18%) of respondents indicated that the Livescribe Pen is very difficult to use.

Instructor/Livescribe Pen Ease of Use Comments

1. Takes a bit of prep time.
2. Easy to record notes, harder to upload them.
3. Writing over someone else's Pencast even though the page was blank—had to redo some work.
4. Easy to use but uploading process is frustrating and time consuming. I may stop using it this semester because of this fact.

Instructor Comments (combined and condensed) regarding the use of a document camera with a Livescribe pen.

1. It is difficult to use a document camera with the Livescribe Pen due to the following:

A. Writing sideways is difficult.
B. The students miss the writing on the board.
C. Color in notes is more important to students than Pencasts.

Instructors Uploading Pencasts

• 4/10 (40%) of respondents indicated that they had problems uploading their own Pencasts.

Instructor Comments About Uploading Pencasts

1. Cannot connect to livescribe.com from Livescribe Desktop—it's a pain.
2. Livescribe desktop crashes EVERY time when uploading a Pencast to mylivescribe. When I restart the program sometimes it fails to bring up the Pencast on mylivescribe.com. Oftentimes it just takes a while.
3. Simpler to post directly to course website, but believe the Word doc is better in the long run since I won't have to redo for next semester.
4. It was hard at first.
5. Easy to record notes, harder to upload them.
6. Easy to use but uploading process is frustrating and time consuming. I may stop using it this semester because of this fact.
7. Problems uploading on time. Wish I had a student mentor to do this.

Instructor Experience with a Student Mentor or Note-taker

• 12/13 (92%) of respondents indicated that the designated student mentor or note-taker associate with the class is helpful to the instructor

Instructor Comments about Student Mentor or Note-taker

1. I don't have one this semester. I had one last semester, and would like one again next semester
2. I would prefer uploading my own notes rather than those taken by a student grappling with new mathematical concepts.