Livescribe® Pulse™ Smartpen - A DIGITAL PEN AND PAPER SOLUTION FOR ONLINE AND TRADITIONAL TEACHING METHODS

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Abstract

The rapid proliferation of technology continues to impact higher education paradigms. The use of digital media technologies can provide an additional conduit for students to better understand classroom concepts. However, many of these technologies require adoption overhead that is unpalatable for some faculty. Teachers that frequently use symbolic nomenclature (mathematics, chemistry, etc.) need solutions that allow them to easily and effectively share concepts with online and traditional learners. The Livescribe Pulse™ Smartpen (LPS) uses microcomputer technology to accurately digitize handwriting (on dot-encoded paper), while recording audio. The user may access the "linked" audio from the handwritten notes by simply "double-tapping" that portion of text. In addition, it provides unprecedented ease in posting handwritten materials (with linked audio) to the Internet (URL that can be placed in an email or posted in a course management system). The LPS requires a minimal learning curve and is relatively inexpensive. Since pen and paper are used, late-adopters feel reasonably comfortable incorporating this technology in their teaching architecture. The LPS provides Tablet-PC features without some of the technology overhead associated with Tablet PCs. In the spring of 2010 selected University of Tennessee at Martin faculty were surveyed to determine their perceptions of the LPS for graduate (online) and undergraduate (traditional) courses (*2010 NACTA Abstract – 125*).

Background

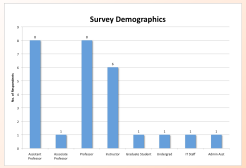
It is important for faculty to have the ability to convey content to students using various media-types to ensure learning takes place. Computer-based technologies are changing the way faculty interact with students. These changes are challenging some faculty member's approaches to teaching in the traditional classroom as well as teaching at a distance (Frey, 2003).

Technology that enables the transfer of *learning objects* to students through digital media is becoming increasingly more relevant in higher education, particularly in light of budgetary issues faced by most institutions. Faculty are more likely to adopt technologies for teaching when the technologies are easy to use and enhance student understanding. Incentives for faculty adoption of innovative teaching technologies are also important for adoption (Roberts, et. al, 2007).

References

Frey, A., Faul, A. and P. Yankelov. "Student Perceptions of Web Assisted Teaching Strategies". *Journal of Social Work Education*. Vol. 39:3 (Fall 2003)

Roberts, F.G., C.L. Kelley, and B.D. Medlin. "Factors influencing accounting faculty members' decision to adopt technology in the classroom" *College Student Journal*; June 2007; pp:423-435.



Survey Demographics
The survey was sent to 65 UT Martin respondents (May 17- 25, 2010). There were 27 responses to the survey (41.5 %). Of the 27 respondents, 18 had purchased a Livescribe SmartPen (LPS) (67% of those responding to the survey).

Survey Item #1. About **35%** of the respondents (27) utilized a Tablet PC in their teaching.

Survey Item #2. Tablet PC uses included: use stylus to solve math problems, drawing graphs, posting solutions to exams, markup of exams, PowerPoint in conjunction with a digital whiteboard, recorded lectures, and sharing notes from articles with students.

Survey Item #3. About **93%** of the respondents (27) were familiar with the capabilities of the LPS.

Survey Item #4. About **67%** of the respondents owned a LPS.

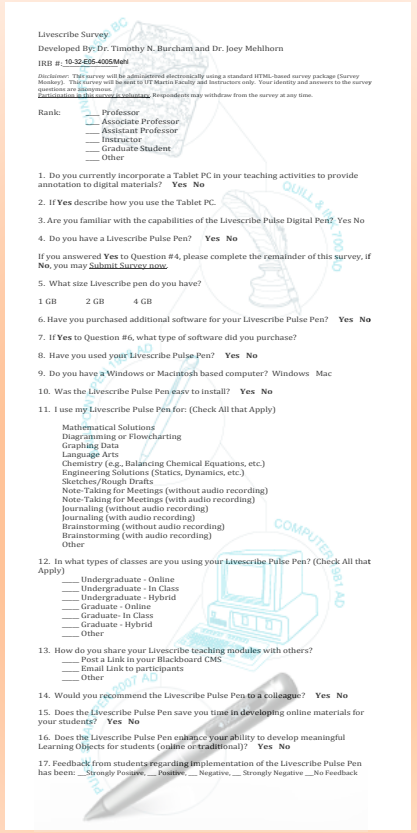
Survey Item #5. LPS Memory Capacity
1 GB 12%
2 GB 44%
4GB 44%

Survey Item #6 & #7. Only two (2) respondents had purchased additional software (MyScript) for their LPS. MyScript converts LPS handwriting to text.

Survey Item #8. About 94% of the respondents (that owned a LPS) have used the device.

Survey Item #9. Of the respondents who have a LPS, 63% utilize a Windows-based computer and 37% use a Macintosh-based computer.

Survey Item #10. About 94% of the respondents who own a LPS indicated that it was easy to install.



Livescribe Survey

Developed By: Dr. Timothy N. Burcham and Dr. Joey Mehlhorn

IRB #: 10-32-E05-4005/MeN

Disclaimer: This survey will be administered electronically using a standard HTML-based survey package (Survey Monkey). This survey will be sent to UT Martin Faculty and Instructors only. Your identity and answers to the survey questions are anonymous.
Participation in this survey is voluntary. Respondents may withdraw from the survey at any time.

Rank:
___ Professor
___ Associate Professor
___ Assistant Professor
___ Instructor
___ Graduate Student
___ Other

1. Do you currently incorporate a Tablet PC in your teaching activities to provide annotation to digital materials? **Yes No**
2. If **Yes** describe how you use the Tablet PC.
3. Are you familiar with the capabilities of the Livescribe Pulse Digital Pen? Yes No
4. Do you have a Livescribe Pulse Pen? **Yes No**

If you answered **Yes** to Question #4, please complete the remainder of this survey, if **No**, you may Submit Survey now.

5. What size Livescribe pen do you have?

1 GB 2 GB 4 GB

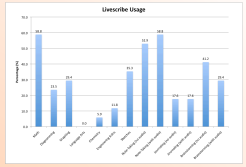
6. Have you purchased additional software for your Livescribe Pulse Pen? **Yes No**
7. If **Yes** to Question #6, what type of software did you purchase?
8. Have you used your Livescribe Pulse Pen? **Yes No**
9. Do you have a Windows or Macintosh based computer? Windows Mac
10. Was the Livescribe Pulse Pen easy to install? **Yes No**
11. I use my Livescribe Pulse Pen for: (Check All that Apply)

Mathematical Solutions
Diagramming or Flowcharting
Graphing Data
Language Arts
Chemistry (e.g., Balancing Chemical Equations, etc.)
Engineering Solutions (Statics, Dynamics, etc.)
Sketches/Rough Drafts
Note-Taking for Meetings (without audio recording)
Note-Taking for Meetings (with audio recording)
Journaling (without audio recording)
Journaling (with audio recording)
Brainstorming (without audio recording)
Brainstorming (with audio recording)
Other

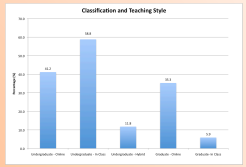
12. In what types of classes are you using your Livescribe Pulse Pen? (Check All that Apply)

___ Undergraduate - Online
___ Undergraduate - In Class
___ Undergraduate - Hybrid
___ Graduate - Online
___ Graduate- In Class
___ Graduate - Hybrid
___ Other

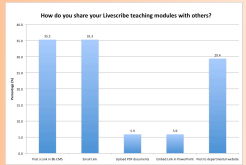
13. How do you share your Livescribe teaching modules with others?
___ Post a Link in your Blackboard CMS
___ Email Link to participants
___ Other
14. Would you recommend the Livescribe Pulse Pen to a colleague? **Yes No**
15. Does the Livescribe Pulse Pen save you time in developing online materials for your students? **Yes No**
16. Does the Livescribe Pulse Pen enhance your ability to develop meaningful Learning Objects for students (online or traditional)? **Yes No**
17. Feedback from students regarding implementation of the Livescribe Pulse Pen has been: ___Strongly Positive, ___ Positive, ___ Negative, ___ Strongly Negative ___No Feedback



Survey Item #11. Livescribe Usage



Survey Item #12. Classification/Teaching Style

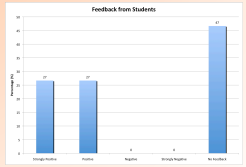


Survey Item #13. Sharing Learning Modules

Survey Item #14. About 94% of respondents would recommend the LPS to a colleague.

Survey Item # 15. About 84% of respondents indicated that the LPS saves time when developing online materials.

Survey Item #16. About 84% of respondents believe the LPS enhances their ability to develop meaningful learning Objects.



Survey Item #17. Student Feedback

Summary

An online survey (using SurveyMonkey.com) was developed to determine the attitudes and acceptance of a digital pen and paper technology (Livescribe Pulse Smartpen) for developing learning objects for traditional and online higher education courses. The survey was sent to 65 individuals using email with a hyperlink to the survey website. The survey was initiated on May 17th, 2010 with follow-up solicitations to complete the survey on May 20th and 25th, 2010.

Of the 65 survey solicitations, 27 responded to the survey for a 41.5% response. About 93% of the respondents were aware of the features and capabilities of the LPS. Eighteen (18) respondents had purchased a Livescribe Pulse Smartpen (LPS). Of the 18 respondents who had purchased the LPS, 17 had utilized it in some fashion to enhance their respective academic endeavors. Of those purchased, about 88% were of the 2 or 4 GB memory size configuration. Only two (2) respondents had purchased additional software for the LPS. In both cases, it was a software solution that converts handwriting to text (MyScript by VisionObjects®, Inc.).

About 67% of respondents that had a LPS used a Windows-based computer, while the remaining 37% used a Macintosh-based systems. The respondents overwhelmingly said the software was easy to install (94%), regardless of computer platform.

Usage of the LPS was dominated by mathematics and note-taking (both at about 59% of respondents). Respondents also used the LPS for brainstorming (41%), sketches (35%), graphing (29%), and diagramming (23%).

Interestingly, for undergraduate instruction, more respondents used the LPS for traditional undergraduate classes (59%) versus undergraduate online (41%). For graduate instruction, online usage (35%) was much higher than traditional (6%).
The primary dissemination methods for LPS learning modules were: Posting LPS link in the Course Management System (35%), emailing the LPS link, and posting LPS link to a website (29%).

While a majority of respondents had not received feedback from their students (47%), those who did received *Strongly Positive* or *Positive* feedback.

"*I believe the Livescribe Pulse Smartpen (LPS) provides an exceptionally easy-to-use tool for teachers to convey information (with synced audio), particularly symbolic information, such as mathematics and chemistry. Posting one's LPS learning objects to the WWW requires only a couple of mouse clicks and one doesn't have to be a webmaster to disseminate modules to students!*"

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All photographs courtesy Livescribe.

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