The Tablet PC: Cool Toy or Useful Tool?

Sara D. Miller

The landscape of technology for classroom instruction continues to expand, along with creative uses for the technology in teaching and learning. The tablet PC, with its digital pen and ink, has opened a new realm of possibility in student interaction, collaboration, and engagement. Study of its use in information literacy instruction has been limited, but the tablet PC and similar technology, i.e., interactive whiteboards, have been tested in several other educational settings.

Brief History of the Tablet PC

The tablet PC, most familiar in the form of a convertible laptop with a swiveling screen or a slate (screen with no keyboard), has its roots in both laptops and handheld devices (PDAs). Microsoft Windows for Pen Computing, released in 1992, marked the beginnings of the more familiar uses of a pen or stylus as the primary input for a computerized interface. The current generation of tablet PCs was reintroduced by Microsoft in 2002 (Garret, 2007).

Some unique features of a tablet PC include increased mobility, flexibility in input methods, and the use of "digital ink." This ink can be used for "e-mail, sketching, instant messaging, games… highlighting, program control… annotation, ink chat, creative work, note-taking, traditional text entry, music creation - and even more.[1]"

Literature Review: Uses in Education and Libraries

Most of the literature involving tablet PCs in classrooms has focused on their uses and methods of implementation. There are many reports detailing the implementation of tablet PCs in K-12 education and higher education. Research studies are not as common; one study done at Seton Hall University (Weitz,

Wachsmuth, & Mirliss, 2006) dealt with faculty attitudes toward incorporating the tablet PC into teaching and learning, as well as defining common classroom uses. The majority of the literature focuses outside of the library or information literacy setting.

Some of the uses for a tablet PC that have been reported are: replacing the instructor's chalkboard or overheads, replacing student notebooks, assisting in virtual office hours, annotating and saving lecture slides as enhanced notes, combining saved lecture notes with audio podcasting, easing the posting of lecture materials on the Web, drawing models or math equations, marking up or annotating documents - both in class and while grading papers for distance students - writing non-English languages, sharing the tablet with students for classroom demonstration, and facilitated collection of classroom data. In the classroom, some of the most novel uses for the tablet PC discussed in the literature involve in-class collaboration between the teacher or presenter and all the students in the classroom. These scenarios involve all participants using networked tablet PCs. In examples presented by Roschelle et al. (2007) and Anderson et al. (2007), software such as Classroom Presenter and Group Scribbles has been used to coordinate this classroom-wide use.

Most reports of the tablet PC's use in libraries center on reference services. The tablet's ease of mobility has made it a natural tool for "roving reference," as documented by Smith and Pietraszewski (2004) at Texas A&M University and by Norman Oder (2003) at the Salem-South Lyon District Library in Michigan. Librarians equipped with a tablet PC and a wireless Internet connection are not tethered to the reference desk, and can go to a patron for more thorough assistance.

Tablet PCs and Pedagogy

Since there is little documentation of the tablet PC's pedagogical implications or use in information literacy classrooms, literature involving interactive whiteboards (a similar pen-based technology) was examined. According to Schroeder

Miller (*Instruction Librarian*)
Michigan State University [East Lansing, MI]

(2007) and Smith, Higgins, Wall, and Miller (2005), the affective domain and motivation are the primary areas in which interactive whiteboards seem to have the greatest impact on learning. The affective domain "focuses on learners' motivations, their attention to and emotional response to learning, and the value they attach to learning" (Schroeder, 2007, Literature Review section, ¶ 14). The "wow factor" of technology such as the interactive whiteboard or tablet PC speaks to these factors.

Another frequently mentioned pedagogical aspect in the literature involving pen-based computing and education is student interaction, participation, and visual stimulation in the classroom. Both the tablet PCs and interactive whiteboards can have a direct effect on interaction and student engagement. In this area, the implications for the two technologies differ slightly. In a classroom that has only one pen-based machine, either an interactive whiteboard or an instructor's tablet PC, the students can still interact by coming to the machine (or having a completely wireless-enabled tablet brought to them) to demonstrate or record for the rest of the class. However, if all of the students in the classroom have access to networked individual tablets, the possibility for collaboration increases significantly.

A function of the tablet PC in the classroom that is repeated throughout much of the literature is its ability to bring life and interaction to a standard PowerPoint presentation through ink annotation. As Anderson et. al. (2007) state, "Slide-based pedagogy relies on fixed, linear content and is geared toward one-to-many communication with limited feedback from the audience" (p.56). The tablet opens up new possibilities for interaction in the traditional lecture setting.

There is evidence that tablet PCs and related technology, if used as part of a collaborative activity, have aided and facilitated student interaction. There is still a question as to whether or not the quality of the interaction has been enhanced (H.J. Smith et al., 2005). This question calls for further, in-depth study. Many pedagogical issues involve the design of the class session, and are the same whether or not a tablet PC or other technology is involved. A lecture-based class does not preclude active or group learning, and likewise a student-centered class does not exclude any lecture or speaking by the instructor. Used as a part of a well-designed lesson, the technology of the tablet PC can have a positive impact on any instructional style.

DRAWBACKS OF THE TABLET PC

H. J. Smith et al. (2005) list several problems and issues found with interactive whiteboards, many of which are also transferable to the tablet PC and other instructional technologies. Practicality issues such as faulty connections, delayed screen changes, or crashes can be issues for any computer-based system. There is also a learning curve for any technology and its related software for both instructors and students. Time constraints can be a factor in preparing materials beforehand to present in class. In a study done by Weitz et al. (2006) on tablet PC implementation by faculty, some of the main difficulties specific to the tablet PC

included screen orientation, the lack of an internal DVD drive, and an oversensitive mouse or touchpad.

TABLET PCS IN INFORMATION LITERACY AT MICHIGAN STATE UNIVERSITY

At the Michigan State University Libraries, a tablet PC has been used in information literacy sessions since 2007. There are currently three librarians using tablets in instruction sessions. Librarians were able to obtain tablet PCs to use as their primary machines when Hewlett Packard introduced the low-cost Compaq tc4400 convertible notebook model. Subsequently, several brands and models of tablet PCs have been introduced that do not have a significantly higher cost than regular laptop computers, making their purchase as a primary PC more palatable.

The sessions at MSU have been taught using a single tablet PC, controlled by the instructor. The tablet takes the place of the desktop presentation PC and remains at the front of the classroom, hard-wired to the projector and the Internet. The session is typically a blend of teacher-fronted lecture and collaborative group activity.

There are several uses that librarians at MSU have found for the tablet in instruction sessions:

1. "Chalkboard" replacement. The tablet has proved especially useful in replacing a chalkboard in search strategy exercises. For these exercises, a sample inquiry or topic is pre-typed as the title of a PowerPoint slide, with the rest of the slide remaining blank. The stylus can be used to highlight or circle keywords, cross out "unimportant" words, and list related terms and keywords which the students brainstorm in order to create a model search and topic list.

2. Marking and annotation of Web pages. Although the current tablet PC software does not allow "drawing" or inking within a Web browser, a screenshot of a Web site is easily inserted into a PowerPoint presentation to be marked. This method is used in a discussion of Web site evaluation. A screenshot of a "hoax" Web site is included in a PowerPoint presentation, and is highlighted and marked by the instructor as the students identify and share clues about the site's credibility.

3. Simple collection of needs assessment data. At the end of the PowerPoint presentation, and after the class is finished, extra slides are prepared. This data can include in-class responses, student questions, demographic, or other information. If class activities are planned beforehand, the slides may contain a premade table that the instructor can quickly fill out, using the pen, with information about the class' performance on the pre-planned tasks. An example of this use would be recording the names

of Web sites where students began a search when asked to find certain types of information during class.

4. Mobility. In one instance, a librarian took advantage of the wireless Internet connection to bring the tablet around the room for individual help as the students were working. The librarian was not able to connect to the overhead projector while roaming, but the tablet was effective for individual student assistance.

The tablet PC is used in the beginning of class to aid in initially engaging students with the keyword brainstorming exercise. As soon as the librarian begins writing on the screen, there are invariably audible expressions of "wow, that's cool" and the like coming from students. Their attention is immediately drawn to the projection. The ensuing brainstorming session helps in holding students' attention once the inking has captured it. It is not certain how long it would take the "novelty" of the tablet to wear off, resulting in wandering attention, if its use were not part of a larger interactive activity.

The tablet's use in the Web site evaluation exercise is quite valuable. The ability to mark up a site helps visual learners and also provides reference points to highlight, reinforcing evaluation issues that were raised as part of the preceding discussion. Using different colors of ink can emphasize page elements that either add to or detract from the Web site's credibility.

Both the brainstorming notes and the Web site markup can be saved and distributed to students after the lecture, either through e-mail or through their course management system. The discussions and ink annotation can also easily be captured live with Camtasia or other screen recording software and archived. The librarians at MSU have not always taken full advantage of these features in library sessions but are looking into doing so as collaboration increases with course instructors.

One drawback encountered with tablet PCs at MSU is while tablets have some mobility, there still could be more. There is a wireless Internet connection available in the instruction rooms, but the tablet PC still needs to be connected by a USB cable in order to use the projector. The wireless connection also tends to be slightly more prone to connectivity problems than the hardwired Internet connection, so instructors tend not to "chance it" and prefer to use the wired connection. The problem of the projector can be addressed with a wireless projector adapter or technology such as Bluetooth. A wireless graphical tablet (a peripheral tablet with a stylus that can be used to interface with any computer) can also increase mobility. An issue also arose involving the class making a list together while viewing a projected Web page. A low-tech solution would involve writing on an additional whiteboard or flip chart, but using a computer would involve the need for a second screen or monitor, or minimizing the screen area when the projected text is already quite small.

THE FUTURE OF TABLETS IN LIBRARY INSTRUCTION

Enhancing the quality of student participation using tablet PCs is an area of research with great potential. How can instructors move beyond simply "using the cool toy" to discovering its effectiveness in other domains? How can the tool be used in ways that are beyond rehashing of older marker and whiteboard/paper or even interactive whiteboard techniques?

The combination of tablet PCs with other hardware is an interesting possibility for maximizing their effectiveness. A tablet can be used with classroom response systems (i.e., "clickers"), wireless graphical tablets, interactive whiteboards, and the like. A wireless tablet or interactive whiteboard enables the markup of live Web pages which can be saved as screenshots. Another tool for the annotation of live Web pages is the Firedoodle browser extension for Mozilla Firefox. The primary functions of this tool are much easier to use with a stylus than a mouse, as with any ink annotation tool.

The use of clickers has the potential to increase student participation in a lecture-based, single tablet PC classroom format. Rogers and Cox (2008) have used this combination and report that displays of clicker-generated data, within PowerPoint, can be annotated easily with the tablet. This interaction gives the students more ownership in the learning process and thereby keeps them more attentive to the lesson being presented.

Microsoft PowerPoint seems to be the software used most often when teaching with a tablet PC. Other software packages that are specialized for tablet PCs, such as Microsoft OneNote, contain features such as handwriting-to-text conversion that could aid in disseminating lecture notes. A tablet-enhanced lecture is also ideal for video capture, as demonstrated by Rogers and Cox (2008), who used Camtasia software to record classes.

Two noteworthy applications have emerged that involve classrooms with multiple networked tablet PCs – one for the instructor and one for each student. With wireless technology, these computers can all communicate with one another and open up vast possibilities for collaborative work, real-time interactive evaluation, and engagement in the classroom. Two software packages have been featured in recent literature on a networked tablet classroom. Classroom Presenter, used by Anderson et al. (2007), enables students to annotate an instructor's slide privately and return the annotated slide to the instructor, who can choose to display it to the class. Group Scribbles, developed and presented by Roschelle et. al. (2007) enables students to write on private virtual "sticky notes" that can be posted to a public space and rearranged by the instructor or other students. One can imagine the potential that this type of software could have in the information literacy classroom: collaboratively developing search strategy, evaluating Web sites, and the like.

Drawbacks to the multiple-tablet model are primarily cost and individual or institutional buy-in. In many of the cases in the literature where this scenario was proposed, namely

in traditional classrooms, the effectiveness of the model would necessitate individual students purchasing their own tablet PCs. However, many library instruction or information literacy sessions are done in computer lab settings where student machines are a permanent part of the room's setup. A multiple-tablet scenario would face far fewer barriers if the permanent machines in a library computer lab were tablet PCs. A uniform lab would eliminate the dependency on students each having a tablet, and make it much easier to maintain a network among the machines. Cost is still a major issue, but decisions in this area would fall to the library or lab maintainers rather than be spread among multiple participants.

CONCLUSION

The tablet PC has definite possibilities for enhancing student engagement, active learning, and motivation in information literacy classrooms. Whether used to enliven a lecture or incorporated into a classroom activity, the tablet PC has great potential to aid learning. While "cool technology" used for its own sake is not necessarily effective, combined with quality instructional design and preparation, the tablet PC can bring a new dimension to the information literacy classroom experience.

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ENDNOTES

1.   http://www.pencomputing.com/frames/tpc_software.html