

Short Communication

## Using Tablet Technology for University Lectures

Victoria Chester

Faculty of Kinesiology, University of New Brunswick, Fredericton, Canada.

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### Abstract

*Tablet PCs provide numerous benefits over traditional electronically projected lectures that use software such as PowerPoint. Flexibility and spontaneity can be achieved by editing or creating notes in real-time. The input pen or stylus is a very useful tool, especially for courses that involve the extensive use of equations or mathematical solutions. Awareness of the availability of additional software programs can enhance the efficacy and enjoyment of Tablet PCs for both the instructor and the students.*

**Keywords:** Tablet technology, PowerPoint, lectures, mathematics

Many lecture-based university courses involve the electronic projection of information from PC software (e.g. PowerPoint). Such methods have several advantages including, the ability to create high quality class material, relatively easy distribution and reuse of information, and the ability to integrate video, audio, and animations into lecture material. In addition, lectures involving detailed drawings or graphs benefit greatly from the ability to create material in advance. However, disadvantages include loss of interactivity and spontaneity, and difficulty controlling the flow and pace of the lecture. In addition, many disciplines such as engineering, biostatistics, chemistry, mathematics, physics, and biomechanics, have detailed equations as part of the lecture content. While software applications such as Microsoft Word offer equation editors to enter equations into PowerPoint slides or documents, such editors can be cumbersome if dealing with complex equations or notations. In addition, students often report that compared to using a blackboard, electronic lectures involving equations results in a loss of “working through the problem”.

The Tablet PC provides all of the advantages of electronic lectures while addressing the aforementioned limitations. Tablet PCs use digital ink that enables on-screen writing, annotations and drawings. Digital ink can be used to edit or modify lecture slides created in PowerPoint for example (Figure 1), or it can be used to create notes in advance or in real-time using custom Tablet software. Numerous reports are available on instructor and student experiences using Tablet PCs in the classroom (Fisher, Cornwell, & Williams, 2007; Loch & Donovan, 2006; Fizz, 2005; Mock, 2004; Anderson, Anderson et al., 2004; Frolik & Zurn, 2004). In addition, several papers have discussed the use of Tablet PCs for lab activities in various disciplines (Chapman, 2008; Huettel, 2006; Dahlmann, Jeschke, Pfeiffer et al., 2006).

There are two main types of tablet designs, namely the slate and the convertible. The slate model is a tablet screen and pen, and does not include a keyboard. The convertible model is similar to a normal laptop but has a pivoting screen that rotates 180 degrees and folds down onto the keyboard. Software included on Microsoft XP for Tablets include One Note and Windows Journal. These e-notepads allow instructors to write text or equations with the stylus pen. In addition, images from other programs and in the internet can be pasted into the e-notepads. Figure 2 shows a portion of a Windows Journal lecture note in which the typed equations were pasted from PowerPoint and the written equations were entered using a stylus.

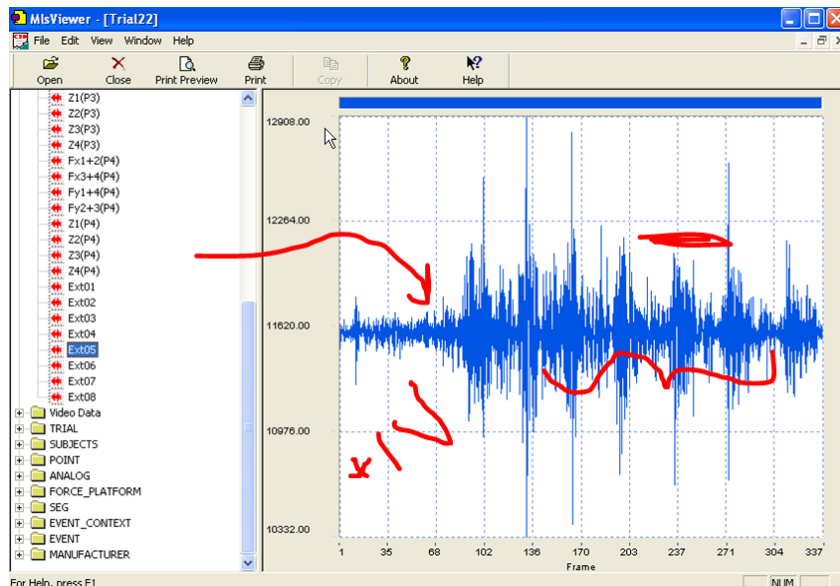


Figure 1 A lecture slide annotated with digital ink

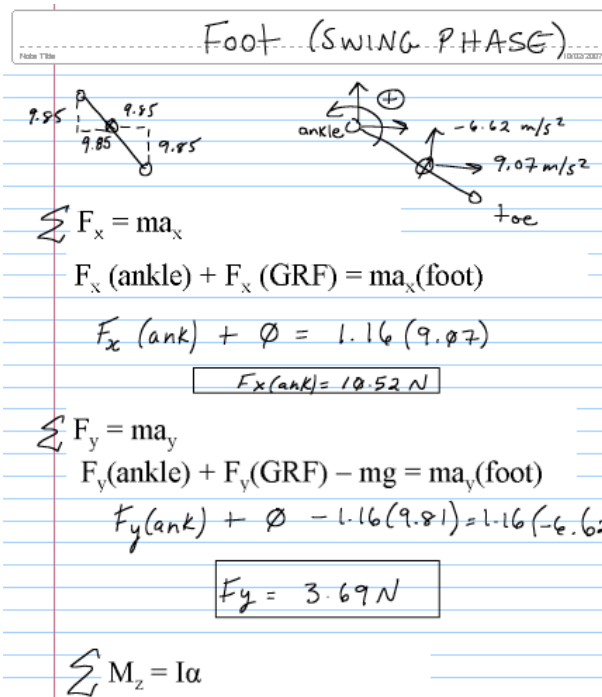


Figure 2 A portion of a Windows Journal lecture note in which the typed equations were pasted from PowerPoint and the written equations were entered using a stylus

To maximize the use of tablet PCs in the classroom, it is important to also be aware of the various free software applications designed specifically for Tablet PCs, including the Microsoft Education Pack and Experience Pack for Tablet PCs and Microsoft PowerToys Tablet PCs (XP/Vista operating systems). The Education Pack contains an Equation Writer that transforms written equations to typed text equations. The Experience Pack contains a very useful snipping tool that is used in conjunction with the tablet pen or stylus. The PowerToys package provides a Physics Illustrator application that consists of a two-dimensional motion simulator. Instructors can draw and animate force vector diagrams and simulate object collisions. Other programs, such as Microsoft Producer, enables instructors to prepare a PowerPoint presentation including digital ink and synchronized audio and video that can be published to the web for student access.

Tablet PCs are also useful for evaluating student papers or other submitted work. The “write anywhere function” allows the user to insert written or typed text on various documents, including Adobe and Microsoft documents. Papers with inked comments can then be returned to students for viewing on a standard laptop or as a printed document.

In summary, Tablet PCs combine the advantages of blackboard lectures with the advantages of electronically projected lectures. Instructors can easily control the flow and pace of the lecture, use attentional marks, and “work through” mathematical problems while retaining the ability to create high quality images in advance. These files can be easily distributed to students for access by standard laptops. Additional benefits include “e-marking”, which greatly reduces the amount of paper that must be handled when evaluating students.

### Communicating Author

Victoria Chester, Faculty of Kinesiology, University of New Brunswick, Fredericton, New Brunswick, Canada, E3B 5A3. Tel: (506) 458-7589. Fax: (506) 453-3511. Email: vchester@unb.ca

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