

# **THE DISTRACTION FACTOR – DOES THE USE OF STUDENT COMPUTERS IN THE CLASSROOM LEAD TO EDUCATIONAL DISTRACTION?**

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## **ABSTRACT**

This paper builds on the earlier results of a study that measured student reactions to a number of components of Tablet PC-based instruction as suggested by self-efficacy precepts. While the initial study found several interesting results supporting self-efficacy precepts in new freshman students, the authors were concerned that student self-efficacy precepts may change as students gain experience and confidence with the system over time. Therefore, a survey focusing on instructional outcomes using Tablet PC computers was administered to both new freshman and returning upper class students during the first week of classes. Analysis of the survey results focus on possible differences between freshman and upper class perceptions of academic performance when using Tablet PC systems in traditional classroom settings. While overall student responses suggest a positive educational experience when using the Tablet PC, significant differences between the freshman and upper class student responses suggest a substantial decline in instructional effectiveness as students gain experience with the Tablet PC.

## **INTRODUCTION**

Dakota State University (DSU) has pursued a technology-based mission since the mid 1980's. As an extension of this mission, in 2004 DSU became one of the first universities in the country to mandate that all incoming students lease and use a Tablet PC as their main computing platform for all academic degree programs. The Tablet PC program has resulted in over 2000 students using these pen based devices in their daily classroom setting. Observation of this environment has lead to questions toward the students use and misuse resulting in distraction.

### **Mobile Computing Platforms as a Classroom Distraction**

The Tablet PC is a new and exciting tool available for student use and, like all powerful tools, presents both opportunities and challenges. Most students respond very well to this sort of challenge, however, students can become distracted by the computer and learning can suffer. Many recent publications promote the positive contribution that this innovation contributes to the learning environment [1] [2].

Tablet-based courses are inherently dependent on technology, which means both students and faculty must effectively use computers and specialized software to exchange information. This means the learning process has a new, added level of complexity; students must not only learn the course material, but also how to use the computer hardware and software effectively. For some students, this dramatically increases the amount of learning required and also the potential for distraction as the student focuses increasingly on the technology and less on the concepts presented in the classroom. [3] has suggested that additional research is needed to identify factors that impede successful training

through the use of technology. Perhaps such agents include web browsing, web mail, Internet chat, among others. Other university professors also report the distraction introduced by mobile computing devices. In fact, these concerns have led two early adopters in area of wireless mobile computing, Bentley and Babson Colleges, to implement a system allowing professors to block some Internet access (USA Today, 2001). Bentley College has implemented a system allowing professors to block Internet access with the flip of a switch. Additionally, some instructors are banning laptop computers in their classrooms at Harvard Law School and other universities [4].

### Sampling and Methodology

Early during the fall 2005 semester, a Tablet PC instructional survey consisting of 23 questions (available from the authors) was administered to 302 incoming freshman students and 75 upper class students taking a junior level information systems class. The survey sought to ascertain an individual student’s initial self-assessed level of Tablet PC expertise and their expected level of distraction. Additional questions asked for student reaction on a number of pedagogical issues including expected test performance, class attendance, boredom in class, etc.

Respondents used a Likert scale to indicate the extent to which they agreed (1 indicates strong agreement) or disagreed (5 indicates strong disagreement) with the statements concerning Tablet PC-based instruction.

### Results

- **Hypothesis 1:** *There will be no difference between new freshman computer users and more experienced upper class students in student self assessment of the Tablet PC as a tool to enhance classroom performance.*

<b>Table 1. t-test results on Tablet PC classroom performance</b>	<b>Freshmen n = 302</b>			
	<b>Group</b>	<b>Mean</b>	<b>Prob&gt;T</b>	<b>Accept/Reject</b>
Having class notes available on my Tablet PC during the class would help me learn.	Freshman result Upper class result	1.577 1.816	0.0120	<b>Reject</b>
My test performance has been enhanced by Tablet PC use.	Freshman result Upper class result	2.838 2.802	0.6744	<b>Accept</b>
My class attendance has improved due to Tablet PC use.	Freshman result Upper class result	2.633 2.943	0.0010	<b>Reject</b>
My <i>expected</i> overall course grade for this course has changed and is _____ due to being taught with Tablet PC technology..	Freshman result Upper class result	3.452 3.239	0.0079	<b>Reject</b>

Table 1 also shows strong differences between the pre- and post-instructional surveys for questions 3, and 4 under Hypotheses 1. Therefore, this study shows that as familiarity with the Tablet PC increased, student expectations held at the beginning of the semester were not replicated by upper class students after using the systems for an academic year. Three out of four of the questions that describe hypothesis one statistically reject the null hypothesis in favor of the alternate which states “*There is a difference between new freshman computer users and more experienced upper class students in student self assessment of the Tablet PC as a tool to enhance classroom performance.*”

- **Hypothesis 2:** *There will be no difference between freshman and upper class business majors in the expected level of in class distraction caused by Tablet PC systems between students based on the student's self-assessment of their level of Tablet PC expertise.*

Question	Freshmen n = 302 Upper Class n = 75			
	N	Mean	Prob>T	Accept/Reject
I think the learning process will be harmed when Tablet PC technology is used.	Freshman result Upper class result	4.069 3.450	0.0000	Reject**
I find using a Tablet PC in class tends to distract me from classroom topics.	Freshman result Upper class result	3.511 2.957	0.0000	Reject**
Wireless connections to the Internet by student Tablet PCs distracts from the class topic and should not be included in classroom settings.	Freshman result Upper class result	4.013 3.253	0.0000	Reject**

Instructors at DSU and other universities worry that students using the Tablet PC and connected to the Internet through a wireless network may negatively impact the classroom experience. Hypothesis Two focuses on these potential student concerns by comparing freshman and upper class student responses to four survey questions. As with Hypothesis one, freshman students were compared with upper class students using t-tests to assess the presence or absence of significant differences.

The absolute value of the results displayed in Table 2 reveals that both groups of students believe that the Tablet PC does not harm the classroom experience and that they would prefer classes be taught using the Tablet. However, upper class students having more experience in using the Tablet PC systems report highly significant differences when compared to freshman responses. In all three questions, upper class student responses were statistically less favorable regarding Tablet PC use in the classroom and indicated the potential for more distraction from class work.

## CONCLUSIONS

This paper reports the results of a study administered to new freshmen and returning upper class students enrolled in courses at Dakota State University during the fall semester of 2005. The survey show that students regard the Tablet PC as an educationally positive addition; however, the significant differences between the freshmen and upper class responses suggest initial student enthusiasm for the Tablet may undergo a significant decline as experience increases.

These results present a potential warning to the very positive, initial review of the incorporation of Tablet PC systems into the classroom. It would be very interesting to relate student expectations with faculty expectations on these computing devices. These studies have been worthwhile, given that placing high performance computing equipment into the hands of students is an expensive proposition that has a direct impact on the academic learning process. Much more information is needed before a final determination can be made on the actual effectiveness of such devices.

## REFERENCES

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