

AC 2010-1345: STRATEGIC ALLIANCES FOR SUCCESSFUL DEPLOYMENT OF INSTRUCTIONAL TECHNOLOGIES

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Strategic Alliances for Successful Deployment of Instructional Technologies

Introduction

Research has shown that TabletPCs enhance the student learning experience¹. The College of Engineering at Virginia Tech University launched the TabletPC initiative in 2006. All incoming freshman student are required to purchase a TabletPC for use in class. The TabletPC is used extensively by the faculty members in the freshman classes, but in-class usage reduces by a significant amount in the senior years. While there are some faculty members who use the TabletPC and all its features extensively in class, there are some who are not very comfortable with use of in-class technology. For convenience, we have classified the faculty members into three types of users; Phase 1 users are those who use simple tools, such as Microsoft PowerPoint[®] without any inking, to teach in class. Phase 2 users are those who use the inking features of the TabletPC to teach in class. Finally, the Phase 3 users are those who used advanced software and features of the TabletPC to teach in class. For instance, faculty members who use DyKnow[®] to teach in class will be classified as a Phase 3 user. In order to increase faculty usage, the College of Engineering has deployed various strategic alliances with internal and external organizations to the university.

Rogers' Diffusion of Innovations theory has been used as a theoretical framework to maximize adoption of instructional technologies². According to Rogers, there are five attributes to be considered when it comes to adoption of technology. They are relative advantage, compatibility, trialability, observability, and complexity. Adoption of technology will be more likely if the complexity of the technology is reduced but relative advantage, compatibility, trialability, and observability are maximized. Figure 1 depicts the strategic alliances maintained to increase faculty/student adoption of TabletPCs, while using Rogers' Diffusion of Innovation theory as a theoretical framework.

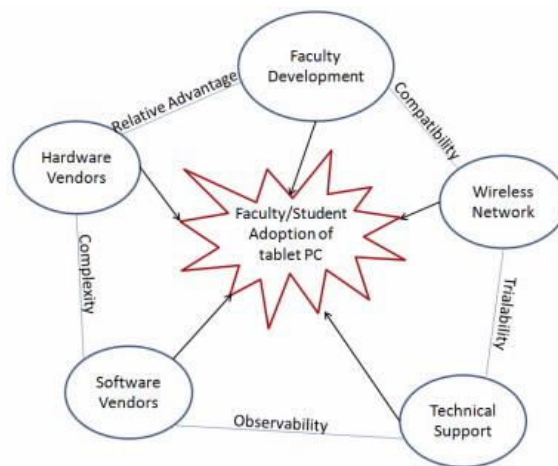


Figure 1: Strategies Alliances Used to Promote Adoption of the TabletPC

Internal alliances

University organizations such as the Communications Network Services Group, Learning Technologies, the Faculty Development Institute, and academic departments are key elements in deploying the technologies into the classroom at Virginia Tech University.

In order to truly maximize the use of TabletPCs, the college infrastructure too has been modified to suit the needs of TabletPC users. The College of Engineering maintains close ties with the Virginia Tech University networking group, Communications Network Services (CNS). All classroom buildings have access to the wireless network. One obstacle that hindered some faculty members from using the TabletPC in class was that some of the older classrooms did not have enough power outlets for students to charge their TabletPCs. To overcome that, the College of Engineering plans to provide each classroom with a box of extension cords so that each student and faculty member will have access to constant power.

The Faculty Development Institute (FDI) at Virginia Tech University offers free training courses to faculty members on how to use the TabletPC and its various functions. The College of Engineering also provides additional support to faculty members who show an interest in using TabletPCs in a classroom environment. The Instructional Technology support team, which consists of graduate students, attempts to maximize the relative advantage, compatibility, trialability, and observability of the technology, by providing one-on-one training sessions with faculty members. In order to reduce complexity, additional students are recruited to join the support team to provide in-class assistance for as long as the faculty members need it. The FDI also offers loaner TabletPCs to faculty members who are interested in trying it out, in order to satisfy the trialability attribute. Faculty members can use these TabletPCs for one semester before they decide to buy one of their own.

There is a team of students who have formed the Software Assistance Triage (SWAT) team that assists faculty members and students with maintenance and repair of their TabletPCs. If required, they loan TabletPCs until the original ones are fixed.

External alliances

External partners, such as hardware and software vendors, provide opportunities for the college to establish reliable partners to support the unexpected situations that arise with large deployment of new technologies.

In fall of 2006, the College of Engineering established a TabletPC computer requirement for all in-coming freshmen engineering students and began an alliance with Fujitsu of America. This alliance seeded the college with computers for faculty and staff to become familiar with supporting and using the TabletPCs in the classroom. This alliance has been especially useful in the promotion of TabletPCs on campus. Initially, faculty members had trouble using the Fujitsu TabletPC with the overhead projectors due to complex settings. Based on recommendations from previous users and the College of

Engineering, Fujitsu has recently launched a new model of the tablet which has much simpler settings. The bookstore on campus sells Fujitsu Tablets to make sure that they are easily accessible.

The TabletPC can be coupled with TabletPC-based software that can make the learning-teaching experience much richer. The College of Engineering has attempted to maintain strategic alliances with such software companies, but there is currently a struggle to keep up with the cost of purchasing licenses to use the software. It is important to establish an effective alliance in order to continue using this product. The other alternative is to use free open source software that provides similar functionality, but there are trade-offs when it comes to reliability.

Using Rogers' attributes for adoption of the TabletPC

Relative advantage

Rogers defines relative advantage as the amount by which a new technology appears superior than the older technology it replaces². Most faculty members use tools such as Microsoft PowerPoint[®] to teach their content. Instead of heading to the whiteboard every time they need to write something additional, they can use the inking feature of the TabletPC. This is not only convenient to use, but it also saves a lot of time in class. This is especially useful for engineering-related subjects that usually involve equations and figures. An added advantage is that they can also send their students the slides with inking, either asynchronously or synchronously, which is extremely beneficial for the students.

Compatibility

According to Rogers, adoption of technology is more likely if the new technology appears to be compatible with the adoptee's lifestyle. The TabletPC does not have to change faculty members' teaching methods significantly. Faculty members can continue to use their old methods, but use the TabletPC inking feature whenever needed. Those who use simple slides to teach can now use the inking features of the TabletPC. Those who use more innovative methods to teach, can make use of collaborative software like DyKnow[®] to make their teaching methods more efficient.

Trialability

Due to the \$1 million grant received by Fujitsu in 2007, the College of Engineering can loan TabletPCs to faculty members to try out before they are committed to purchase one. This allows the faculty members to try the TabletPC out at their own convenience. This also allows the Phase 1 and Phase 2 users to try and practice advanced software before they use them in class. Phase 2 users are given one-on-one training by the support team on slightly more advanced tools such as DyKnow[®]. They are also given instructor and student access to dummy classes so that they can test it out at their own convenience. FDI also holds various training sessions on TabletPC tools for faculty members.

Observability

In 2007, the College of Engineering won a Laureate Medal at Computerworld's Honors program for its TabletPC based teaching-learning environment. This award brought the advantages of teaching with the TabletPC to light. Another area which highlighted the benefits of the TabletPC was the Workshop on the Impact of Pen-Based Technology on Education (WIPTE) which was held locally in 2009 and will be held at the same location in 2010. This conference was useful in identifying the advantages of using a TabletPC in class as well as discovering new tools and techniques to use the TabletPC. In order to increase the observability of the advantage of using the TabletPC, the College of Engineering plans to invite all the department heads to the same conference in 2010.

Complexity

It is essential that the TabletPC must not appear to be complex to users. In order to ensure that, the various types of users (Phase 1, 2 and 3) have been identified. Based on their experience and comfort, they are introduced to new tools. For instance, a Phase 1 user is one who uses Microsoft PowerPoint[®] in class, will be introduced to the inking features available with the same tool; while a Phase 2 user will be introduced to slightly more advanced software such as DyKnow[®]. This is to ensure that faculty members are not too overwhelmed with new tools that they cannot handle. Based on their comfort, there is also in-class support provided for the first six weeks of school.

Future plans

The College of Engineering plans to increase the number of TabletPC users by targeting faculty members who show an interest in the TabletPC. The FDI maintains a record of all the attendees of their various training sessions. Faculty members who have attended courses related to the TabletPC will be identified and will be offered additional training so that they can use the TabletPC comfortably in class.

The College of Engineering is now looking at extending the use of the TabletPC to graduate courses. If a faculty member is interested in using the inking features of the TabletPC in a graduate course, the College of Engineering plans to loan TabletPCs to the faculty member as well as to the students if required.

There is a 4-year longitudinal study in progress on faculty members and their instructional strategies. The College of Engineering will use the results of the study to improve the overall teaching-learning experience.

Conclusion

The strategies described above have proved successful for the adoption of TabletPCs. Since the TabletPC initiative, there has been a great increase in the use of the TabletPC in class. Collaborative instructional technologies, such as DyKnow[®] and OneNote[®] are being frequently utilized for inking in class. Faculty members are now investigating the

use of the TabletPC for electronic grading, course delivery, and ways to promote interactivity and active learning in class. The strategies discussed will now be extended to promote the TabletPC among graduate students and faculty members teaching our graduate distance learning courses.

References

1. Koile K, Singer D (2006). Development of a Tablet –PC Based System to Increase Instructor-Student Classroom Interactions and Student Learning. The Impact of Pen-based technology on Education.
2. Rogers, Everett (1963). Diffusion of Innovations. (Third Ed.) (First Ed., 1962), New York: Free Press.