Ubiquitous Presenter: Increasing Interaction in a Digital Lecturing Environment

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What is it?

Ubiquitous Presenter (UP), at the University of California, San Diego (UCSD), allows instructors to annotate prepared slides during lecture and provides students with the means to create and submit their own slide annotations. Instructors using this presentation system are able to retain the advantages of pre-prepared lecture slides (structure, detail, coherence) while gaining the flexibility of on-the-fly inking, providing students with impromptu clarifications, illuminating diagrams, and step-by-step in-class examples.

At the same time that a slide presentation is projected on a large display screen, students can view the lecturer’s prepared slides through a Web browser on their personal computers, watching it unfold along with all the lecturer’s inked remarks, drawings, and diagrams. Alternatively, students can “unsynchronize” from the lecturer and move among the slides at their leisure. Because the lecture presentation is delivered to students over the Web and is stored in the UP server, all the annotations that the instructor makes are saved on the Web as well. This means that students can use the Web to review the entire presentation anytime, anywhere.

More significant still is the way in which the UP program supports active learning in lecture through Web-based student submissions. Depending on their personal computing device, students can type (using a standard laptop) or draw and write (using a Tablet PC) responses to sample problems or surveys. Using UP’s student submission feature, lecturers can monitor student understanding, solicit immediate feedback, and incorporate student questions into the class session. When the instructor wants to invite student participation during lecture, he or she simply selects that option on the UP Web interface, and the submissions are loaded onto the menu bar. At this point, the instructor can choose whether to display a student submission during lecture. All student submissions are archived and, like the lectures themselves, remain available for student review at a later date. Students report that the submission feature’s anonymity is part of its allure, helping to overcome the shyness and inhibition that often stands in the way of participatory learning, setting the stage for a more engaging, student-centered experience.

Working with the UP program is simple. An instructor registers with the UP server hosted by UCSD, downloads and installs the UP program on his or her Tablet PC, opens a UP instructor’s account, and creates a “classroom.” Students enroll in this classroom using a password provided by the instructor. To create lectures, the instructor can opt to use PowerPoint (in which case, a UP plug-in is required) or UP’s DeckBuilder. In order to make the lecture viewable on the Web, the instructor must save the lecture in the UP file format and place it within the UP classroom created earlier. Finally, UP has a whiteboard feature that gives instructors the option of lecturing without premade slides. As with annotations on premade slides, students can view and retrieve any ink that the instructor inscribes on the “whiteboard deck.”

What problem does it solve?

Instructional techniques have long been influenced by presentation technologies, from the blackboard and projector to the current generation of in-class educational tools for visuals that establish a shared context for lecture and discussion. Electronic slides that have been prepared in advance can improve the organization of the presentation, but they can also limit spontaneity.

UP offers instructors a way of enlivening lecture without dramatically changing their work processes or teaching style. For those lecturers who have always illustrated their points by writing key ideas on the blackboard and drawing explanatory diagrams, UP not only enables those spontaneous interactions but captures them for future review. To address lack of participation due to student shyness, UP allows students to participate anonymously in class discussion by writing comments and questions on the slides and sending them directly to the instructor.

In a recent UP survey of 46 UCSD computer science students (in which confidence and positive self-perception is one of the indicators of success), 77 percent reported that the use of student-provided solutions either in class or out of class gave them more confidence in their abilities in an introductory course in computer programming. Students found value in looking at other students’ active learning work through the UP Web site interface, with 91 percent indicating that they felt seeing other students’ solutions had an affect on their learning experience. Another survey of introductory economics students at UCSD...
revealed that 81 percent felt they had paid more attention to lecture because of the presentation system. More than 90 percent of students responded that the instructor’s ability to annotate the electronic slides had a positive effect on their understanding of the material.

How did they do it?
Despite the popularity of the Tablet PC–based Classroom Presenter, developed at the University of Washington, it soon became apparent that there were two significant barriers to that system’s widespread deployment. Its reliance on Tablet PCs would limit the number of students who could participate. Although many students owned laptops, very few of them were Tablet PCs. Meanwhile, the system relied on an expensive multicast networking architecture with availability and accessibility issues. UCSD responded to these limitations by developing the Web-based UP, which uses a client/server model and works with Tablet and non-Tablet devices alike. Students can bring their own laptops to class and access the interactive system through a Web browser. Already, certain benefits have materialized as a result of this shift to a Web-based client/server architecture. By archiving the annotated slides, the UP system provides students with a lasting resource they can return to again and again. Since different learning styles require greater flexibility, the UP program permits students to opt out of the synchronized mode during lecture in order to continue reviewing a particular slide even after the lecturer has moved on to the next one. All inked annotations are captured on the UP Web server, ensuring that students who switch to asynchronous mode can do so without missing anything.

Why is it noteworthy?
- **Comfortable yet transformational:** UP transforms the digital lecturing environment by allowing instructors to augment slide presentations in response to student needs and to check for student understanding.
- **Participatory:** UP supports active learning through its student submission feature, making it possible to engage large numbers of students in participatory activities. In effect, the technology supports “going to the whiteboard” activities.
- **Replicable:** Currently, any instructor at any institution can open an account on the UCSD server, gain access to the UP program, and create UP classrooms hosted by UCSD free of charge. UCSD plans to release its open source code for free download sometime this summer so that any institution that wants to run its own UP server for non-commercial use may do so. Prior to making an investment in UP, colleges and universities may want to be sure demand for UP justifies a server of its own. Therefore, UCSD plans to continue to provide server space for those institutions that are just getting started.
- **Easy to implement:** To use the UP program, each instructor will need a Tablet PC, students will need personal laptops for class, and the classroom must have Internet access along with adequate electrical power.

To learn more
Visit the Ubiquitous Presenter Web site at [http://up.ucsd.edu/](http://up.ucsd.edu/)

To share your innovation
If your institution has a practice that you believe would be of interest to the EDUCAUSE Learning Initiative, please share it with us. To submit your innovation for review, please use the ELI Innovations Contribution Form on our Community Exchange page [http://www.educause.edu/ELICommunityExchange/6797](http://www.educause.edu/ELICommunityExchange/6797). A panel will review your submission and make a recommendation to the ELI staff.

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The EDUCAUSE Learning Initiative (ELI) is a community of higher education institutions and organizations committed to advancing learning through IT innovation. To achieve this mission, ELI focuses on learners, learning principles and practices, and learning technologies. We believe that using IT to improve learning requires a solid understanding of learners and how they learn. It also requires effective practices enabled by learning technologies. We encourage institutions to use this report to broaden awareness and improve effective teaching and learning practice.