

Archiving Student Solutions with Tablet PCs in a Discussion-based Introductory Physics Class

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Why archive student work?

Student work is important

- Small group work is central to many PER-inspired curricula
- Group responses are co-constructed and differ from any individual's work
- Students' work is often the focus of whole class discussions

Small group work is seldom preserved

- Students' work is lost when a whiteboard is erased
- Instructor notes during whole class discussion are also lost

→ If students work in a digital medium, materials can be archived for later review.

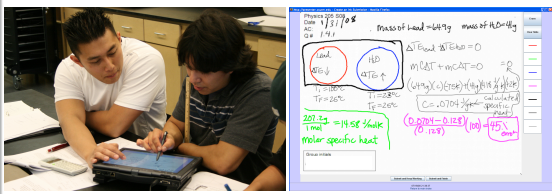
We explore the use of archived student work by

- Students
- Instructors
- Curriculum developers and researchers

Automatically archiving student work

Ubiquitous Presenter A Tablet PC-based system developed at UC San Diego *Free at <http://up.ucsd.edu>*

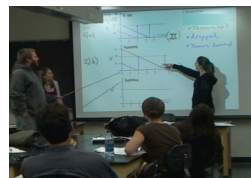
- Students access workspace via a web interface & use ink or text to create a response.
- Students can send their work to the instructor's Tablet
- The instructor can preview, project, & annotate submissions from any of the groups in the class.
- The instructor can write on prepared or blank slides, using the system to lecture
- All student submissions, instructor slides, and added ink are automatically archived
- Archived slides can be reviewed synchronously via a web interface.



Setting

Physics 205 at CSU San Marcos

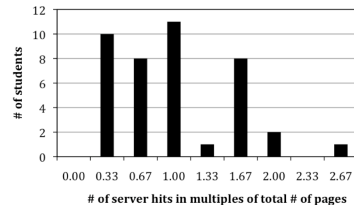
- Intro calculus-based physics course for students in the biological sciences.
- Class meets 2x/week in discussion/lab format, 6 hr total
- Students respond to prompts in groups, then report responses in whole class discussion.
- Total lecture time is ~75 minutes per week



Student use of archived materials

Students viewed many slides online

Number of server hits by student, in multiples of total number of pages (375). n = 41



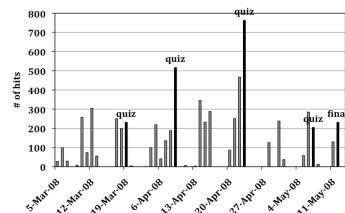
Students heavily viewed student-generated work

- 56% of server hits were on slides created by students (student work accounted for about 84% of all slides)
- 75% of students reported access to other students' work was useful or very useful

Reasons students viewed material on the web

- Reviewing for a test or quiz (76% self reported)
- Solving homework problems (66% self reported)
- Checking notes from a missed class (29% self reported)
- Group problem solving in class (based on observations)

Number of daily server hits. This section began using Tablet PCs and UP on March 5.



Instructor use of archived materials

During discussions with students outside of class

- Students brought printed copies of in-class work to office hours
- Entire archive was available online for instructor and students to explore together

During in-class discussions and lecture

- Instructor could browse, choose, and project relevant student work from prior activities
- Students could resume a partially completed activity at the beginning of the next class session

For formative assessment

- Instructor could review student work between classes, then make adjustments to the following class

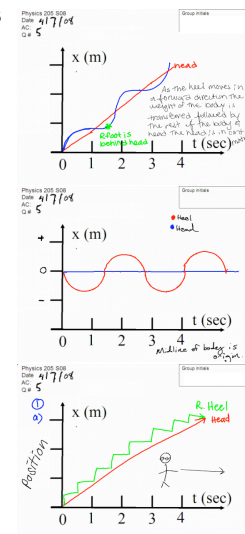
Researcher/Curriculum developer use of archived materials

With unobtrusive access to students' classroom work, researchers can

- Obtain insight into the range of student thinking on a topic
- Develop of a database of responses to a sequence of activities
- Track student progress throughout a semester.

Curriculum developers can

- Evaluate student interpretation of an activity
- Gather examples for instructor support materials
- Evaluate students' progress on an activity within a given time limit



Sample student responses when asked to graph the position of a walking person's head and heel vs time

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