

Center for Educational Computing Symposium

Teaching Physics and Engaging Students With an Interactive White Board

by Rod Ziolkowski

(* denotes slide number)

*1 Good Morning, It is pleasure to be with you this morning. I am honored to be invited to Tokyo and have the opportunity to participate in this important Symposium. I would like to thank Dr. Yasutaka Shimizu of the Educational Resources Research Center at the National Institute for Educational Policy Research in Japan and Mr. Kouichi Seki of the Center for Educational Computing for their kind invitation and generous hospitality.

*2 My name is Rod Ziolkowski. *3 I teach physics and digital film making at Whitney High School. *4 Whitney is a 7-12 grade magnet school for high achieving students in Cerritos California, a suburb of Los Angeles.

*5 I would like to share examples with you today of how I use an Interactive White Board to teach physics. *6 Hopefully you will see the profound impact that using an Interactive White Board has made on my teaching methods, and on student learning.

Our school received 15 Interactive White Boards, called “SmartBoards” , manufactured by Smart Technologies, of Calgary Canada, as a part of the Intel Model Schools Program.

*7 In order for new technology to be useful in education, it must improve student learning, or make the teaching process easier or more powerful. I have found that Interactive White Boards meet all of these goals.

*8 One of the things I appreciate most about our Interactive White Boards is that they are flexible enough to accommodate a wide range of teaching styles. Some teachers on our staff prepare their lessons as PowerPoint presentations, with imbedded media and web sites, *9 some use Word documents to review and edit student writing. *10 Others base their lessons on Web sites with special graphics or animations or multimedia demonstrations. It seems each teacher has developed an individualized way of using Interactive White Boards.

*11 I use an Interactive White Board every day in my classroom, I find I can easily create rich experiences for my students that were impossible with a traditional white board.

--We take data from digital pictures

--*12 We analyze movie clips.

--*13 We can write on images that are big enough for the whole class to see, label important features, and save these annotations for later reference.

--*14 When students are working with their wireless laptops, they pick up new computer skills easily because I can model these skills at the same time on the Interactive White Board.

--*15 I have found that I am much more likely to use Internet based resources to supplement instruction or to address students' questions because the Interactive White Board makes internet websites so easy to access, view and capture.

*16 Ultimately, this technology helps me foster a learning environment that is meaningful and challenging for my students.

*17 I teach physics. I value the experimental basis for physics. Students in basic physics classes require active, real experiences with motion, light, sound, electricity, and magnetism. I do not use an Interactive White Board as a substitute for real experience, I use it to expand on real experiences and provide experiences students would not have in the traditional classroom.

Here are a few examples of what I mean—

*18 We do experiments almost every day. I take digital pictures of the experiments for display on the Interactive White Board.

*19 These pictures may be shot before class and used as a guide for students when they set-up the equipment. This is the set-up a spring experiment.

*20 After the experiment, we analyze data and interpret results on the Interactive White Board. In this case students experimentally determined the spring equation. As we discuss the experiment together, I can label important parts of the experiment.

*21 We can set up calculations or report out the results obtained by each group.

*22 I can easily change the screen to graph paper to quickly plot sample results.

*23 Most often, the pictures are shot during class as students work on an experiment. Here

students are observing interference in soap bubbles.

*24 I took a digital picture of one of the bubbles, for discussion. What process could explain this pattern of colors?

*25 I insert a graphic we found on the internet, to help describe the process.

*26 Here students are conducting an experiment to determine the acceleration due to gravity.

*27 I demonstrated how to enter data into a spreadsheet on the Interactive White Board, as students worked on their laptop computers, I wanted students to learn how to fit an equation to their data using “Excel” spreadsheets.

The Large screen format makes it easy for my students to see text-rich documents like spreadsheets or internet sites.

I can supplement the experiments students conduct with images of experiments that would be difficult for the whole class to do.

*28 For example here are some digital pictures I shot inside my car. *29 By analyzing this photograph, *30 students calculated the acceleration of my car, or *31 from these photos they calculated the radius of my turn.

All of my student could not fit in my car, but by using digital pictures on an Interactive White Board, I can enlarge my classroom. When you include all of the opportunities which are available for free on the internet, my classroom can expand to the size of the Earth with the click of a button.

*32 Here some 8th grade students are studying astronomy. They are measuring the altitude of the Sun so that they can observe the path of the Sun across the sky.

*33 In class we can access an internet site to check the accuracy of their results. *34

*35 Next I change the background of the Interactive White Board to polar graph paper, so that students can plot their results in a sky map. There are hundreds of prepared Templates available for all types of applications.

*36 I use the Interactive White Board in my class everyday. *37 The Interactive White Board is the breakthrough technology that connects the internet, *38 digital imaging, and computer

applications like *39 spreadsheets, word processing, *40 modeling, and presentation software in one easy package for teachers. The best part is it that is easy to use....and save

*41 I have most of my lessons saved. So they are only a click away. I can help a student that was absent and missed class. I can quickly review the lesson from the day before, or finish a lesson that takes more than one period.

*42 Within a lesson I never erase the board, I just add a new page. Students often ask me to go back to a page we had up earlier in the lesson, and I can go back with a quick touch of the screen.

*43 They students may need clarification, or have missed a subtle distinction between situations, and I can help in a way that is impossible with a traditional board.

*44 Using Interactive White Boards at our school has changed the expectations of our student and teachers. They have come to expect that technology will be integrated seamlessly and meaningfully into instruction, and the learning environment need not be bound by the walls of the classroom.

*45 Thank you!