Center for Teaching Excellence
Hampton University
Teaching Matters

Student Engagement and Learning with Technology-II
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Regardless of the category a learner may belong to (*e.g.,* visual, auditory or kinesthetic), the literature supports the engaged learning to be most effective [Davis, Pierce, Verma and Pinkston-Betts, VSTE Journal. Vol. 19, No. 2, 2005, 14 – 19]. It has been found that the amount of knowledge retained depends on how passively or actively the learner was involved in process. In an ordinary lecture class, where the student just sits (very passively) and listens to the lecture, the student remembers only 10% of the talk. On the other hand, if he passively sees (any visual aid) and hears the professor's lecture, he retains 30% of presentation. If the professor's presentation is interactive, where the student has to not only see and hear but also watch and be ready to participate in the discussion, he remembers 50% of material presented. The level of retention increases with the student's involvement in the learning process. The student learns most when he has to hear, see, watch, figure out and present before others. A teacher can make the lecture/presentation more engaging and effective using meaningful technology. Using technology, he can make the class more active. Response Systems have been around for several decades and until recently were only a luxury for the corporate world. The education community can afford it now to use in classrooms to keep entire classes engaged and active. The systems have become even more accessible, seeing as the publishers offer these with their textbooks. This system can make teaching more effective than the traditional teaching.

What is a Response System? A typical response system has two components – hardware and software. Using "PowerPoint," a teacher flashes a question on the screen. The student uses a TV-remote-control-like device (transmitters, more commonly called "Clicker") to respond to the question privately, and the response is collected immediately by the teacher's computer (receiver). [A list of URLs for various response systems is given at the end of this article]. The data collected by the teacher's computer is analyzed instantly. A response system is used in the "Ask the Audience" lifeline of "Who Wants to be a Millionaire?" a very popular TV game show. The type of transmitter ranges from very basic—it can have only a few buttons to answer one of the choices the teacher has flashed—to very sophisticated—it can also transmit multiple choices at a time or the student's confidence level for each response. There are response systems that are very rich in features and are user friendly. A unit with similar functionality (TI Navigator, by Texas Instruments, Inc.), where a teacher can send questions containing graphs,

images, or open-ended questions to his students and collect their responses is gaining popularity in the recent decade. The Navigator system uses TI-83/84 Plus calculators. All these response systems communicate wirelessly.

What are the benefits of using a response system in instruction? Using a response system in instruction can keep students engaged and active. Teachers can involve the "entire" class to get the student's individual response and get a sense of students' understanding of a concept. Such frequent assessments can help an instructor pinpoint the exact location of students' weaknesses. As the answers are communicated in private, even the shy and less confident students do not hesitate to participate. The system can help monitor progress of an individual student throughout the course. Depending on the responses, a teacher may decide either to skip a concept or to re-teach the concept. For a larger class, the response system can be used to take attendance. Using the team/group feature of the system, a teacher may ask a group to discuss the question among themselves before responding. Such discussion will encourage the students to use the subject vocabulary/ terminology during the discussion and will help improve the understanding of the subject. The system can be used for pop-quizzes during the lecture, which can keep students alert throughout the class and force them to make sure to ask the instructor if they have not understood the material. The system can also be used as a quick way to pre- and post-survey. Grades are collected in spreadsheet format. Data from several assessments can be merged together. The system can be used for formative and summative evaluation. These days, publishers are packaging response units with the textbook, which include pre-built questions for teachers to use with the units. The textbook publishers may use one of the response system listed at the end. Over the decade, numerous articles and surveys have been published on the effectiveness of the use of the response system in the classroom. Extensive research done by the Vanderbilt Center for Teaching supports that it is pedagogically sound to use such a system in instruction as it enhances the cognitive awareness of a learner. It helps transform a passive learner into an active learner. Decision Tree Consulting (DTC), a worldwide research and market analyst, has been researching the PRS market for 3 years with the following findings: • Over 7 million voting handsets have been sold from 2003 to 2006 • In 2006 3.2 million voting handsets were sold, 48% increase over 2005, a annual end-user value of $178m • There will be 8.6 million voting handsets in 2008.

URLs of various response systems: (1) TI-Navigator System, (2) e-Instruction, (3) Reply Systems, (4) H-ITT Classroom Response System, (5) Interwrite PRS, (6) Option Power Audience Response Systems, (7) Padgett Audio Response, (8) Pantelis Audio Response Systems, (9) Quick Tally Audio response Systems, (10) Quizdom's Students Response Systems, (11) TurningPoint Audio Response Systems. [These links are live on the e-Newsletter version. Please use "CTRL + click" to follow the link]