Benefits of Student Response Systems (Clickers)

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Abstract

Clickers, while not a new technology to the education environment has been gaining more notoriety among students and teachers in higher education. When clickers first were introduced to the educational environment were not widely used until the mid 1990's. Since then teachers and students have come to view the benefits to both of them. Teachers noticed better attendance, and immediate feedback to what the class knows, students gain a deeper understanding of the lesson being taught. They are also allowed group interaction in discussing the lesson, which helps students who may not understand it. The future of clickers seems to be bright as it starts to take more of a hold in higher education. The advancement of clickers will take it into another arena as it is able to incorporate its system into distant learning.

Benefits of Student Response Systems (Clickers)

Today's society is ever changing to incorporate new technologies in every aspect of life. Every year along with introductions of new techniques in teaching there are also new technologies to enhance learning in students. The teaching techniques that are trying to be enforced now move the learner from a passive position to an active participant in their own learning. A technology that is getting more attention in doing just this is a device called a student response system or clicker. Clickers have been around for many years, but in recent years have come full circle and are finally finding their place in higher education classrooms. Many teachers along with students are finding that the benefits far outweigh the negatives of this system. If this technology keeps getting the attention it deserves, it will become a staple in classrooms with new developments to make it feasible for everyone at every level of education.

What are Clickers

Student response systems or clickers are "a set of hardware and software that facilitates teaching activities". (Bruff, Derek) Newer clickers look similar to a calculator with screens that allow students to display numeric, short text responses as well as true, false and multiple choice. Clickers work by having sensors that are in the front or back of the room and are linked to the instructor's computer. The sensors read the responses of the students and import them into the software on the computer. Once the answers are tallied, they can then be quickly converted into a histogram that will show the percentage of students that chose each answer. These individual grades can also be uploaded into a grade book for the teacher.

There are three different types of Clicker systems currently available. The first according to The University of Minnesota (2009) are infrared systems. They are also the cheapest, but require the users to have an unobstructed view to the sensor in the room. These are for smaller

classrooms, since the sensor can only accommodate 40-80 clickers depending on the system. The second is a radio transmission. This is a more expensive unit, since it does not rely on line of sight transmission, but radio frequencies. This system can accommodate up to 500 clickers at one time. One problem that was experienced was when there was the same system in another room it would pick up the transmissions from the other room. The third type of clicker system is the Wi-Fi system. It requires an 802.11b/g/n wireless network to communicate with student's wireless devices. The students are able to use smart phones, PDAs, wireless laptops, and tablet PCs to relay their answers, and receive the questions. This system does not require any additional infrastructure, since it has the wireless network set up.

When implementing clickers into classrooms, instructors need to set up sensors, and download free software into their computers to allow their systems to read the responses, and record them. The instructor's lessons are relayed in a PowerPoint with slides that allow for the questions to be answered by the clickers. Students as well have to prepare when using clickers, after buying them they need to register them, and usually pay a fee of four to ten dollars for each class they will be using them. This is still seen as a benefit for students since the clicker relays how their knowledge measures up with other students in the classroom, with histograms that show the percentage of the students' answers to the question posed. Clickers are creating an active learning environment where there was only passive learning.

History of Clickers

Clickers first made their debut in the mid 1980's as classroom communication systems. In 1985 the founders of Better Education Inc. had wanted to come up with a way for teachers to interact with every student, by getting all students actively involved, allowing the teacher to understand what every student knows, and spot what each student doesn't know, re-teach areas

that were not learned, and check homework to see how all the students are doing. The product that was created was "Classtalk", but without all the funding needed to finish the project, they contacted Texas Instruments to try and make a better system. (Better Education, 2010) Texas Instruments was not only able to help, but was also demonstrated prototypes at educational conferences. Better Education Inc. has since sold the rights to Classtalk, and other companies are now creating their own designs that are on the market today. Since the first student response systems have been introduced, they have been many advances to make clickers more user friendly, not only by the students, but also for the teachers and their choice of computers

Benefits to Teachers

The invention of the clickers was intended to help instructors address all students' needs, this way no child would be left behind. The clickers do this by allowing the teacher an instant response to questions on what was learned. Teachers are able to easily see where the students are struggling, and then revamp instruction to help address areas of concern. Koenig (2010) reported:

> "Because I have to write or choose appropriate clicker questions, I think about my teaching more now. I construct my lectures focusing on how best to present new material to students rather than just presenting it as the text does. I think my lectures are better designed now to support student learning as I have to think about the learning process." "The use of clickers made me think more about my teaching . . .

It had also demonstrated to college professors that in prior lessons smarter students were answering the questions. This thinking left the rest of the class out with the assumption that the class also knew the material. Since it is more widely used in classrooms, instructors are seeing that the benefits outweigh the negatives. Although clickers have not been proven to significantly

raise students' grades, they have helped foster a deeper learning of concepts. Teachers that are using and understand the clickers are finding that they're creating active learning environments. Trees and Jackson (2007) :

> "students see beyond the technology, to recognize the deeper issue of an instructor's pedagogical commitments." (35).

Another benefit that university professors are reporting is that attendance that was a problem with many large college classes increases with the use of clickers in a classroom. Even when many of the instructors did not use the clicker for attendance, students still showed up for class, which gave the student more exposure to what is being taught.

Benefits to Students

Students who have used clickers have found that it creates a more active learning environment. They are engaged and part of the discussion. Students who have found them selves in classes with clickers have preferred to have clickers in other classes in the future. Many of the students liked the group interaction to learn or teach concepts with the other group members. Reay, Pengfei, and Bao (2008) Stated:

> Proper use of clickers impacts student understanding not only by making the learning environment active, but also by making evident any knowledge gaps and misconceptions that the students may have.

It has helped students to see what other students in their class know, and what they may need to work on more. Students that would have sat in the back and slept are now participating in discussion with clickers. Using clickers creates anonymity so that the students do not feel the pressure of answering the wrong answer, and having others judge them. With this anonymity, students are more likely to contribute and learn in an active environment. In most of the research that I found, clickers may have raised scores as much as a grade level, but would not

bring an F student into the A arena. What most of the research showed, was that students in the middle group improved, but that the A's, D's, and F's stayed the same. When students were surveyed, they preferred using the clickers feeling that they learned more from the instruction that in any classes before.

Future or Clickers in a classroom

New generation of technology will be able to be text message capable, and will be able to communicate with web enabled cell phones. The management software will be hosted on the instructor's computer or on a server somewhere on the network. With some of the new software Response Ware, students are able to use their cell phones and laptops to communicate wit Wi-Fi. With Response Ware, instructors can even communicate with another classroom elsewhere incorporating distant learning into the teaching arena.

Clickers are a technology that has been around for about 25 years, but have only started to pick up momentum of being used in the classroom the last ten years. There are benefits for both the instructors and the students. They help create an active environment where there was only passive learning prior. The future of clickers is leaning toward using phones, laptops, or technology with Wi-Fi technology.

Although clickers have been around for many years, it is gaining new life in higher education, with benefits to both teachers and students. Teachers like being able to view what the whole class knows, so that they can cater their classes to areas that are lacking. Increase of attendance, as well as easy of use has made this a technology that instructors are now looking into if they are not using it already in their classes. Students like the active learning environment that they are creating, and are preferring them to older styles of lectures. The clicker technology

is still evolving to advance new techniques that allow the instructor and student flexibility in where and how the student can still participate and learn.

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