Consider three devices: the clicker (used by students to indicate response in a lecture classroom), an iPod (with downloadable podcasts; and a cell phone (with in/out messaging). Analyze through comparisons and contrasts the instructional potential of these three devices. Based upon this, chose one as being superior and justify your position. As an addendum, discuss the social and economic impacts of choosing one of the technologies for classroom use.

Does Technology Increase Student Learning and Motivation? A Comparison of Clicker, Cell Phone, and iPod

Technology has different meanings and uses for different generations (Edmondson, 2008). Students, generally of a younger generation, want to be everywhere at the same time and do multiple activities at once. They want to not only master material, but do so quickly. They have this hunger for life that keeps them going nonstop and “multiply possibilities” (Edmondson, 2008, p.22).

Educators are often looking for ways to not only increase student learning, but motivation as well. The addition of technology is often a catalyst for increasing motivation, but does its inclusion in the learning process really work? Or is it just a distracter to the learning goal? A literature review on the learning and motivational outcomes of three technologic devices, clicker, cell phone, and iPod, can help make a decision as to which device is best for inclusion and its social and economic impact.

Clicker

The clicker, also known as audience response system, is a handheld, wireless device used to poll students. Other common names include student response system and personal response system. This technology requires a keypad, computer, receiver, software, and questions which
are pre-determined and integrated into the presentation, usually through a PowerPoint presentation.

There are two general types of keypads available, infrared and radio frequency (Adams & Howard, 2009). Infrared keypads are the most basic; however, they require “a direct line of sight” to the input device, or receiver (Adams & Howard, 2009, p. 54). Only true/false, yes/no, and multiple choice questions can be accommodated using an infrared audience response system. The more advanced radio frequency keypads do not require a direct line of sight to the receiver and can also accommodate numeric answers. Turning Technologies, LLC has a third option for student response: personal mobile devices. A student’s personal mobile device or computer can be used as the keypad. This option adds the possibility of essay and multiple response questions to be asked.

Immediacy and engagement are the two main advantages of using the clicker during instruction. After the question is asked, students select their answer using the keypad. Once all students have submitted their answers, the results are displayed in a histogram on the screen. The histogram allows the instructor instant insight into understanding (Adams & Howard, 2009, Beckert, Fauth, & Olsen, 2009). Based on the results, the instructor can quickly modify the lecture or discussion to achieve the desired outcome (Draper, 2002). The instructor can also give explanations for both correct and incorrect answer choices (Wit, 2003). This tool allows the instructor to know what the students are thinking at any given point in time, in a convenient and time-effective fashion. The immediacy of assessment and feedback also meets the quick mastery requirement of the younger generation, allowing for repetition, which can increase retention and student learning (Kennedy & Cutts, 2005).
Using the clicker, students have the opportunity to positively engage in the classroom discussion without ridicule (Adams & Howard, 2009; Wit, 2003). This anonymity encourages student involvement, decreasing the familiar passive student role because the fear of providing an incorrect answer in public is no longer an issue (Draper, 2002). The increased engagement allows more opportunity for students to demonstrate their understanding or lack thereof.

If used correctly, the clicker can encourage both class and peer discussion. Wit (2003) suggests using the dual question approach. A question is posed, students submit their answer, and then they pair up and discuss their responses with each other. After the peer discussion, the instructor asks the question again and students resubmit their answers, which may be different than their original answer. This exercise is particularly helpful for the questions that produced low correct responses. Instructors can also ask about the same concept but with different questions to get a more accurate impression of student understanding.

The clicker is not only beneficial in the small classroom (Beckert et al., 2009), but also for the large classroom (Wit, 2003). Wit (2003) found that it allowed students enrolled in a large class to become more involved in the learning process by producing “their own answers rather than just listening to the one person who answers” (p. 19). He also found that students appreciated the immediate answers and explanations. Overall, the students had positive reactions to the inclusion of the clicker in the classroom. One of the main benefits Wit (2003) discovered was knowing the students’ knowledge about the subject matter before they took an examination. It also gave the students a more accurate insight into how much they grasped the concepts before taking the examination. Beckert et al. (2009) also found that students were positive about the inclusion on the clicker in the classroom, and they did not think the clickers was distracting, but that they were more attentive to the lecture.
Adams and Howard (2009) caution educators to limit the use of the clicker; as the novelty does wear off if used too often and unnecessarily. This could result in the students using them in a negative or nonchalant way, thus decreasing their educational value.

Cell Phone

Cell phones are mainstream with 75% of teens, 58% of 12 year olds, 90% of young adults and 83% of adults having one for their personal use (Pew Internet, 2010). Norris and Soloway (2010) predict that within five years, every student will have a personal cell phone. Already, cell phones are integrated into many facets of everyday life – contacts, alarm, calendar, networking, photography, and videography. They are the primary method of communication for students, and text messaging is the primary mode of personal communication among students (Harley et al., 2007; Prensky, 2005). More than 70% of adults and 95% of young adults send and receive text messages (Pew Internet, 2010). Taking and receiving pictures is also a standard activity on cell phones. Cell phone models range from the basic, which includes voice, text, and MMS data, to the BlackBerry Smartphones and Apple iPhones, which include numerous other organizational, social, and education functions.

Creativity is required, but cell phones can support education goals. The SMS, or text messaging, capability of all cell phones affords the device a beginning role in education; albeit, a debatable role. Foreign language educators have already integrated this device into their curricula (Ash, 2010; Cavus & Ibrahim, 2009; Lu, 2008). Ash (2010) describes how cell phones are used to deliver clues for virtual scavenger hunts to English as a second language students. Students given clues must translate them to correctly complete the activity. Cavus & Ibrahim (2009) developed a text messaging system that sent technical terms with definitions to students.
numerous times throughout the day. The program was a success with respect to both student engagement and learning outcomes. Posttest scores increase to an 89.77 average from the 24.68 pretest average.

Other institutions are using text messaging to help students adjust to the university or college setting, as well as course management activities (Ash, 2010; Harley et al., 2007; Kovalik & Hosler, 2010; Pramsane & Sanjaya, 2006). Ash (2010) describes how Text Marks, an online tool, can be used to send out reminders about upcoming coursework to students. Harvey et al. (2007) stresses the importance of using technology that the students are already using to draw them into the university or college community, “an awareness of the social importance of texting and an engagement with this medium is essential” (p. 238). Harvey et al. (2007) also found that some students felt text messages from university staff and professors were more personalized and accessible.

Research shows that students appreciate and value the information received via SMS (Kovalik & Hosler, 2010; Richardson & Lenaric, 2008). Receiving assignment grades and announcements encouraged the students to stay on task. Students in the Kovalik & Hosler (2010) study felt motivated to log into their online course more frequently because of the text messages. In return, students felt more connected to the course and had a greater chance of success.

While it is not as intuitive, cell phones can also be used for polling and checking student understanding quickly. The caveat is that all students need a cell phone or internet access to participate. Using Poll Everywhere, a data collection tool, students can use their cell phones as part of an audience response system, allowing for the same advantages of feedback immediacy and engagement as the clicker. An additional advantage of using Poll Everywhere is the option to
include a CNBC-style crawler within the presentation so that audience members can submit questions throughout the lecture. This will give the instructor ongoing knowledge of student understanding. This additional feature also has the anonymity factor; therefore, students can ask questions without feeling embarrassed.

To students, cell phones are more than an important communication device. (Walling, 2009). They are media tools with enormous potential that can be creatively used in the classroom.

iPod

An iPod is a portable media player in which music, games, movies, and podcasts can be accessed. Some models also have a video camera, FM radio, speaker, and pedometer, and other features may include a calendar, contact list, to-do list, and photo storage. A step up from an iPod (shuffle, nano, and classic) is the iPod touch, which has a multi-touch interface, personal digital assistant and Wi-Fi capabilities. iPods are mainly used in education for podcasting purposes because they do not have the audience response capability of the clicker or cell phone, unless one is using an iPod Touch with Wi-Fi access.

Podcasts are defined as syndicated video or audio media files available on the Internet (Podcast, n.d.). These recordings can be played on an mp3 player or iPod, or on a computer. Topics for podcasts are limitless and are not restricted to education. Educational use of podcasts range from lectures to providing individualized assignment feedback (Cooper, 2008). An advantage of the most intuitive use of podcasting, lecture delivery, is that students can listen to the recording anytime and anywhere (Niemuth, 2010). Unlike in class, they are not restricted to hearing the information once which can be beneficial to certain students. It also is convenient to
listen to a lecture while engaged in another activity, like walking to class, driving to school, or cleaning the house. One cannot read a textbook while doing these activities. Teachers can also download podcasts for students to listen to while in class to spark discussion.

While podcasting does have the advantage of mobile delivery, Hew (2009) found that students primarily listened to the podcasts on computers. Also, Hew’s (2009) meta-analysis concluded that student learning does not increase simply by the use of podcasts. Traphagan, Kucsera, and Kishi’s (2010) study supports this statement and includes the notion that podcasts might be an appropriate replacement for face-to-face lecture. This assertion can also have an impact in distance education. Students often view online courses as a solitary effort. If podcasts, webcasts, and videos were included into the online course, students may feel a greater connection to the course and its material.

A podcast’s can make a greater impact on education and student learning. Cooper (2008) investigated the use of podcasts in delivering individual feedback on student assignments. It was found that this method of feedback not only increased student motivation, but student self-regulation as well. Students felt that the audio was more personalized and effective, helping them internalize the material and encouraging them to work harder on the next assignment.

My Pick and its Social and Economic Impact

As Olson (2010) points out, proficiency with technology should not be the learning goal when incorporating technology in the classroom; however, its use should also not hinder the learning process. The focus should be on learning and not the device. Technology is constantly evolving, and improved technology may be more proficient the day after one implements a new learning aid.
If I had to pick one of these three technological devices to include in my classroom, I would select the cell phone. It is the one device that is already in the student’s hand, and it is the one without a learning curve to overcome. Cell phones, with an additional program on the teacher’s part, have the same capability as the Clicker. By using the cell phone for polling and quick surveys, the extensive costs of the Clicker is avoided. This is important in the current economic state of most educational institutions. Polls Everywhere has a free account for higher education. A teacher can create an unlimited number of polls for an unlimited number of courses; however, each course size is limited to 32 participants. While actual respondents cannot be identified with the free plan, polls can be developed for PowerPoint inclusion and results can be analyzed through Excel. Another advantage of using Polls Everywhere versus the Clicker is that responses are not limited to cell phones; students who have their computers in class can also participate as long as the classroom has WiFi. In short, student understanding can be assessed using their own personal cell phones, a capability the iPods lack.

Cell phones have the SMS feature that the Clicker and basic iPod do not. SMS can be used to engage the student in the course content by using a tool they have most likely mastered. Course management information, such as due dates and general announcements can also be sent to multiple students at once. I would guess that most students and teachers have unlimited text messaging with their cell phone services. If they do not, text messaging bundles are relatively inexpensive, beginning with $5.00 for 200 messages per month (Mulberry, n.d.). This cost is reasonable, and sending educational messages should be practiced at a frequency that would not max out the message limit. Again, iPods do not have this capability.

Podcasting is the feature that is intuitive to iPods, but not necessarily to cell phones. However, it appears that students are not utilizing this technology to its fullest potential. Maybe
it is because transferring the podcast to the iPod requires downloading. Students may feel that if they can listen to the podcasts on a computer, then it is unnecessary to waste the space on their iPod or mp3 player.

Socially, cell phones have the greatest impact. This may be negative or positive, depending on one’s beliefs of their value in education. Cell phones have the capability of integrating education into society and the social environment of the student. It is evident that students have cell phones and use them every day in multiple aspects of life. Why not make them educational as well? Cell phones can connect students to each other, the teacher, the course, to the subject matter, and to the educational institution. On the other hand, it is important that their use is not abused and seen as disruptive to the students’ personal life. Boundaries also need to be set for student use in the classroom. Students need to know that it is not a free for all, that they can use their cell phones at will during valuable class time.
References


