Turning Technologies Student Response Systems
A Performance Based Accountability Solution

Education is a process of teaching, learning, and outcomes related to a particular subject matter. The utilization of technology within this process can significantly impact both the instructor's methods and the learner's outcomes through increasing efficiency and diversifying instructional options. Few technologies have the ability to transform education as both a pedagogical and accountability tool. Turning Technologies' student response systems [SRS] have consistently proven to enhance effective teaching methods and provide higher education institutions the ability to implement learning assessment processes, report student progress indicators and lead to measurable gains in student retention, learning, degree completion and career competency.

What is a Student Response System?

Student response technology is straight forward and simple, enabling an instructor to digitalize student data both in the teaching moment and aggregated over time. The core functionality allows instructors to pose a question to the students, students press the button on their wireless ResponseCard keypad that matches their choice, and then the results of the entire group are displayed on a graph. Each ResponseCard has a unique identifier that is registered to the student. This allows instructors to correlate and store response data instantaneously as well as to create over thirty reports ranging from attendance, item analysis, whole group evaluation and individualized student performance.

Why is It Important?

The combination of a highly competitive global economy with a domestic unemployment rate of nearly double the historical average has prompted a fundamental shift across postsecondary institutions from enrollment to performance. Student response technology offers a unique ability to provide an efficient solution for collecting predictive student data while simultaneously implementing quality teaching strategies proven to positively influence student learning. The need to define and collect intermediate student achievement data beyond enrollment or graduation rates has grown in importance and is student centric.

Why Now?

Improving the student performance in postsecondary institutions, including community colleges, has increasingly taken center stage in state economic recovery plans. The Health Care and Education Reconciliation Act of 2010 has brought a new focus of accountability to the postsecondary institutions. After our nation's steady slide to the twelfth position of countries who with the highest college graduates, the current administration has clearly stated a goal to claim the lead by 2020. Considering that currently less than 60 percent of students entering four-year institutions earn bachelor's degrees, significant modifications are needed both in teaching methods and student tracking in order to improve graduation rates to a level that surpasses all other nations.

Research Studies

Ten years of research across disciplines, student demographics, class size and institution size support student response technology as a comprehensive solution that can promote student satisfaction, encourage engagement, improve instruction, analyze performance, increase attendance and raise retention rates.

- 83% of students indicated the use of clickers helped them monitor their understanding of class content.

- Performance on test items targeted by in-class questions increased by an average of 21% while control test questions increased by only 3%.

- The percentage of students earning A's increased from 23% to 40%, and the percentage of students receiving C's or D's in the course decreased from 34% to 21%.

- The mean pass rate for traditional lecture sections was less than 60%, while for audience-paced instruction sections was over 80%.

- SRS made class lectures more engaging (87%) and motivational (63%).

- Enhanced learning in class lectures (73%).

- Improved attendance from 60% to 90%.

- Increased retention up to the final exam from 90% to 95%.

- 70% of students agreed that they were more likely to participate because of the anonymity of the SRS.

The National Commission on Accountability in Higher Education has prioritized data collection since releasing the 2005 report, Accountability for Better Results: A National Imperative for Higher Education. The Commission called on government and Institutes of Higher Education to collect more data on students in an effort to improve academic quality and performance. Digitalizing the collection of data is a core competency of student response technology, and the ability for Turning Technologies' solutions to seamlessly interface with both course management and data warehouse solutions enables institutions to meet the challenge for increased accountability.

About the Benefits

Student response technology has been used in higher education for over fifteen years and has been researched heavily. The body of research consistently validates the ability of this technology to positively influence teaching, student learning, and outcomes.

Student response systems provide the following benefits:

- **Accountability**: The digital collection of data enabled by SRS provides an effective mechanism to track program effectiveness and performance for accreditation.

- **Engagement**: Depict students' psychological investment in learning, also increasingly used to describe meaningful student involvement throughout the learning environment.

- **Active Learning**: Involvement of learners directly and actively in the learning process itself. Instead of simply receiving information verbally and visually, students receive, participate, and do.

- **Identification of At Risk Students**: Strong correlation exists between the registration of a student clicker and student's overall performance in the course they are registering their clicker.

- **Peer Instruction**: The learners are asked a question and formulate their own answers; they then discuss their answers in groups attempting to reach consensus on the correct answer. This process forces students to think through the arguments they develop, and enables them (as well as the instructor) to assess their understanding of the concepts even before they leave the classroom.

- **Feedback and Understanding**: Active involvement in the discovery process, in addition to immediate feedback, promotes retention and the correction of initially inaccurate response strategies. Student response technology supports the rapid questioning model and the positive reinforcement of correct responses. Response systems also allow instructors to closely monitor learner's responses and expectation of learning mastery.

- **Assessment For Learning**: Assessments OF learning check to see if the learners have met required objectives versus Assessments FOR Learning which are designed to check if the learner is making progress toward meeting objectives during the learning process. One is for accountability, while the other supports learning.

- **Spacing Effect**: Learners easily remember or learn items when they are studied a few times over a long period of time.

- **Motivation:** There are four steps to promote and sustain motivation in the learning process: Attention, Relevance, Confidence, Satisfaction (ARCS). A learner's attention has to be aroused and sustained, there must be relevance of what is being learned, confidence built and a correlation between effort and results.

- **Formative Assessment**: Feedback is more effective for students when it leads them to the correct answer, as opposed to simply telling a student whether they are correct or incorrect.

Who is Doing It?

Harvard University	Dr. Eric Mazur

- The Peer Instruction model has resulted in an **increase both in the percentage of correct answers and the confidence of the students.**
- In one of Mazur's studies, close to one third of the class correctly revised their initially incorrect answer, while only 3% changed from correct to incorrect.
- The overall results show **significant learning gains**.

Boston University	Pary Fassihi

- TurningPoint SRS was used to facilitate active learning strategies and promote interaction in the ESL classroom to include peer instruction and 100% participation.
- Response systems provide the conditions necessary for form-focused student-to-student and student-to-teacher interaction. This active learning encourages the production of language, which leads to achievement over time.
- Dissertation available.

Ohio State University	Bill Reay

- Approximately **10% increase on final exam scores earned by students using clickers** throughout the physics curriculum versus those students who did not use clickers.
- **Instant assessment of student understanding in real-time,** allowing instructors the ability to dictate the direction of class material.
- Development of the "question-sequence method," that offers a series of questions to test a concept instead of a solitary question, **allowing students to grasp ideas in a shorter period of time.**
- Quarterly surveys reveal that the **percentage of students favoring the use of ResponseCards is higher than 90%.**

University of Kentucky	Jennifer Cowley

- TurningPoint is the "perfect" medium to prepare students to pass NCLEX, the licensure exam that all graduating nursing students need to pass in order to practice nursing, which is important for both teachers and students. Before every exam I have an optional "Clicker Review" outside of class time. For 60 minutes, all I do is post clicker questions related to the upcoming exam content.
- I have 100 students in my class and typically get 80% of the students to turn out for these "optional" exam reviews. I think that turnout speaks volumes for the effectiveness of clickers in the classroom.

Case Studies

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More Information

Turning Technologies: www.turningtechnologies.com   TurningTalk User Community: www.turning-talk.com