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Student Response Systems That Work On All Devices

Student Response Systems That Work On All Devices

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Goals and Objectives

Preparing Today's Students for Tomorrow's World. Whether you teach in whole-class, individualized, small-group or peer-to-peer learning environment, the goal of the 21st century classroom is to bring together data, resources, tools and expertise to positively impact teaching and learning.

Student achievement is driven to provide a learning environment that can be personalized, timely and relevant. Teachers have to understand what students have achieved, where they should head next and how they can collaborate to effectively reach that destination. It requires a coordinated effort, bringing together best practices in learning and assessment tools with engaging, targeted content and instruction.

The 21st century classroom aims not simply to teach students facts, but also to help them develop the lifelong skills they need to succeed. Effective collaborative learning ensures that each learner is an active participant and cultivates valuable communication, problem-solving and collaboration skills.

Student response systems draw students into every lesson that is taught with rich digital media, real-world activities and opportunities for active participation. Student response systems allow teachers to gauge learners' background knowledge before getting started and check comprehension during and after a lesson to ensure targeted, effective instruction; with simple, quick formative assessments.

Student Response Systems will

… enhance classroom communication and discussion and provide every student the opportunity to confidently participate.

… reduce lesson preparation and grading time and focus on precious instructional time.

… make assessment easy, fun and immediately effective as a part of learning.

… give teachers instant access to results, allows them to address any difficulties right away, ensuring that each learner achieves the lesson objectives.

… Allow teachers to use the detailed data to intervene as needed, to identify students who are ready for a new challenge.

ISTE (technology) standards for teachers

1. Facilitate and inspire student learning and creativity
2. Design and develop digital age learning experiences and assessments
3. Model digital age work and learning
4. Promote and model digital citizenship and responsibility
5. Engage in professional growth and leadership

Course Overview

Are you looking for a way to increase student engagement and learning in your classes? Student response system (sometimes called a personal response system, classroom response system, or audience response system) is a set of hardware and software that facilitates teaching activities. A Student Response System (SRS) is technology that promotes and implements active and cooperative learning. Beatty (2004) states that "By engaging their minds in class, (SRS) based instruction makes students active participants in the learning process." It allows students to anonymously commit to an instructor-posed question in class and provides immediate feedback. It is a software and hardware system in which students submit answers to questions via a transmitter, or "clicker."

Some primary benefits of teaching with a Student Response System:

- ✓ Students are encouraged to commit to answers anonymously in class so their knowledge is not revealed publicly; however, their answers are graded privately afterward so they receive credit based on their own responses, and
- ✓ Immediate feedback is provided for students and the instructor about a particular question.

Why Use Student Response Systems

A teacher can use a SRS to…

…**Maintain students' attention during a lecture**. Studies show that most people's attention lapses after 10 to 18 minutes of passive listening. Inserting a few SRS-facilitated activities every so often during a lecture can help maintain students' attention.

…**Promote active student engagement during a lecture**. Posing well-chosen questions to students during lecture and expecting answers from each student can cause students to reflect on and assimilate course content during class.

…**Promote discussion and collaboration among students during class** with group exercises that require students to discuss and come to a consensus.

…**Encourage participation from each and every student in a class**. Asking a question verbally and calling on the first student to raise his or her hand results in one student participating. A SRS-facilitated activity can involve not one, but all of the students in the class.

…**Create a safe space for shy and unsure students to participate in class**. A SRS gives students a chance to respond to a teacher's question silently and privately, enabling student who might not typically speak up in class to express their thoughts and opinions. A SRS also enables students to respond anonymously to sensitive ethical, legal, and moral questions.

…**Check for student understanding during class**. By asking SRS-facilitated questions, teachers can determine if students understand important points or distinctions raised in class. They need not wait until homework is turned in or exams are completed to do so. Instead they can receive feedback on a lecture during that same lecture.

…**Teach in a way that adapts to the immediate learning needs of his or her students**. If a histogram of student answers shows that a significant number of students chose wrong answers to a question, then the teacher can revisit or clarify the points he or she just made in class. If a histogram shows that most students chose the correct answers to a question, then the teacher can move on to another topic.

…**Take attendance and to rapidly grade in-class quizzes**, provided that each transmitter is assigned to a unique student over the length of a course. Note that different SRS systems provide different levels of support for anonymous and non-anonymous usage.

…**Add a little drama to class**. There is often a sense of expectation as students wait for the histogram to appear showing how their classmates answered a given question.

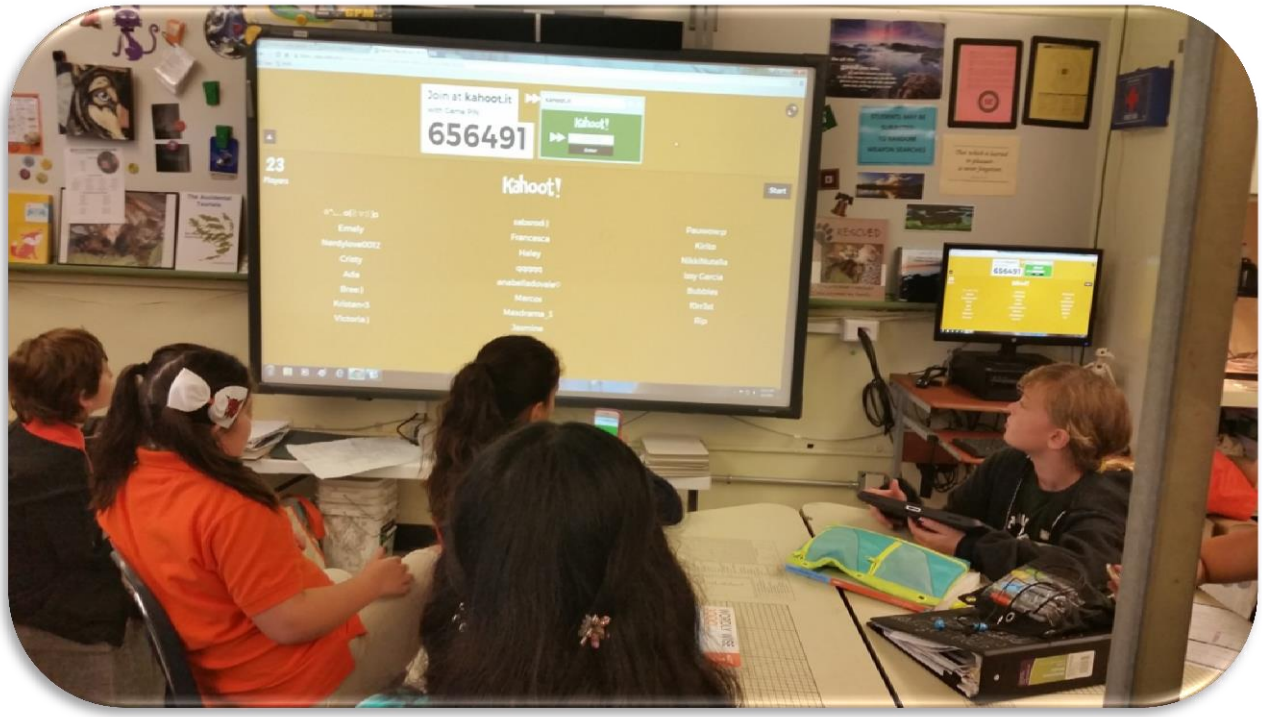
Challenges in Using Student Response Systems

- As with any use of computer technology in the classroom, **technical problems can arise**. A teacher using a SRS should allow time at the beginning of class to set-up and troubleshoot the SRS. Internet and wireless capabilities can also pose issues. Also, non-SRS back-up activities should be planned in the event of a total SRS failure.
- **Getting started with a SRS takes some time.** Having an experienced user around is helpful. Adapting lesson plans to take advantage of clickers takes time, too. However, it is often not hard to start small by adding a question or two to each class, particularly if the instructor has a good idea where students are likely to have difficulties.
- Most SRS technology restricts teachers to posing multiple-choice questions, and **writing effective multiple-choice questions can be challenging**. Knowledge of common student mistakes and misconceptions can be useful in designing wrong answers to multiple-choice questions. Asking students open-ended questions and then adapting their responses into later multiple-choice questions can also be effective. Some instructors take student suggestions for answer choices during class. Others take advantage of existing banks of questions in their disciplines.

- **Using SRS in class takes up class time.** Students need to have a defined name or ID number to be used each time. Students need to remember it when logging in. Moreover, a few minutes will be needed for students to transmit their answers, and class time will be used discussing student responses. Some teachers have responded to this challenge by relying on pre-class reading assignments to convey portions of course material.
- The wrong answers that students choose in response to a multiple-choice question can reveal that the students have misconceptions, but **knowing that students have misconceptions does not necessarily reveal what those misconceptions are**. Teachers using SRS questions sometimes find it surprising when large numbers of students choose certain wrong answers, and further classroom

discussion is sometimes needed to explore why students chose the wrong answers they did.

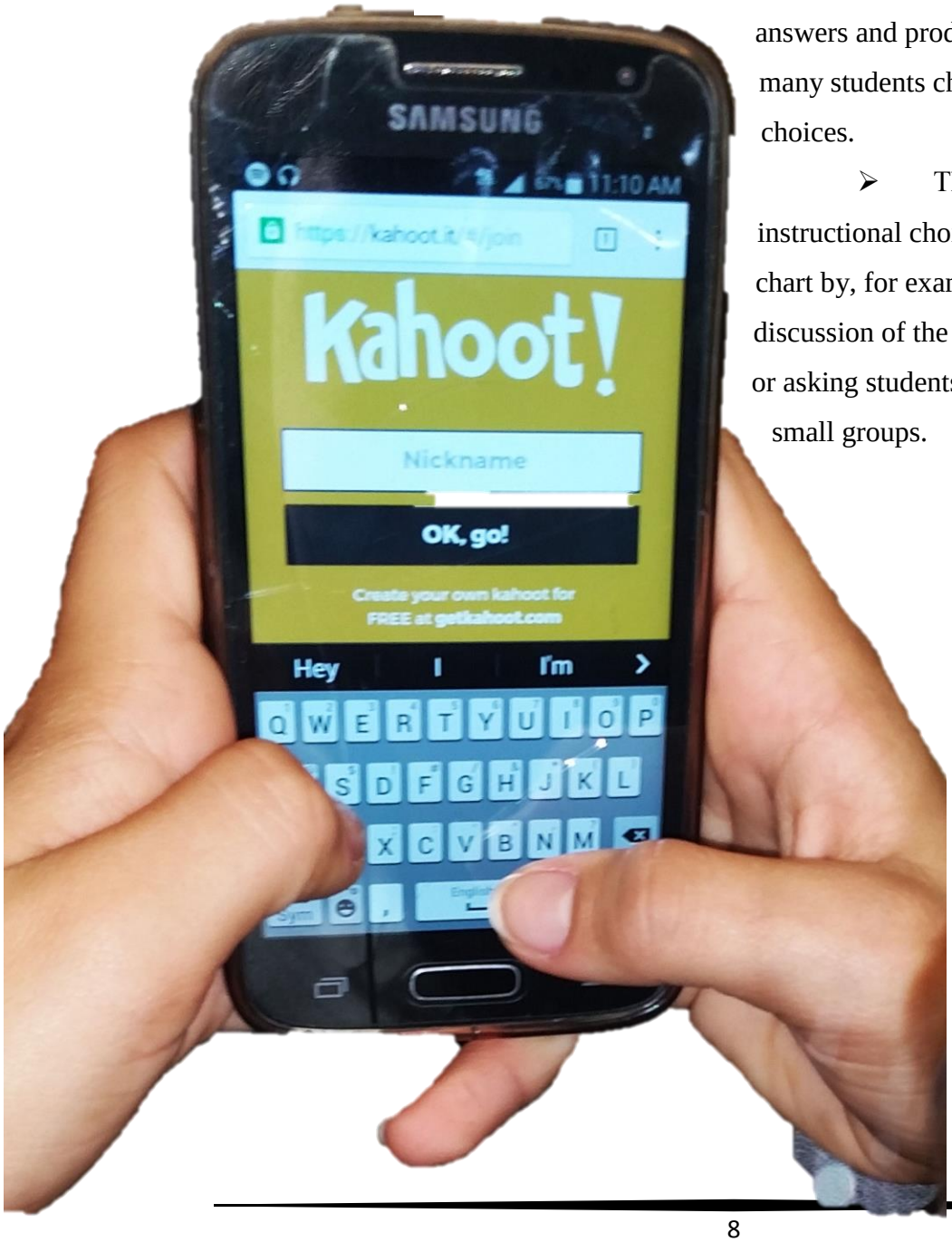
- When a teacher uses a SRS to check for student understanding during class, if it turns out the students do not understanding a particular concept or application, then **the teacher may have to change his or her lesson plan "on the fly."** This can be challenging for teachers who are used to preparing their lessons thoroughly in advance or who do not think on their feet as well as some. Instructors often must decide when to move on to the next topic, what to do about students who answer incorrectly when it is time to move on, what to do if only a small proportion of students get a question correct, and what to do if students are still confused after the instructor gives his or her best explanation.
- Many instructors use clickers to lead into class-wide discussions, and **leading class-wide discussions can be challenging for instructors used to just lecturing**.



Step-by-step guide in implementing

What a Student Response System general looks like:

- A teacher poses a multiple-choice question to his or her students via a computer projector.
- Each student submits an answer to the question using a handheld transmitter (a "clicker") that beams a radio-frequency signal to a receiver attached to the teacher's computer.
- Software on the teacher's computer collects the students' answers and produces a bar chart showing how many students chose each of the answer choices.
- The teacher makes "on the fly" instructional choices in response to the bar chart by, for example, leading students in a discussion of the merits of each answer choice or asking students to discuss the question in small groups.



Variation of the Theme: Types of Questions

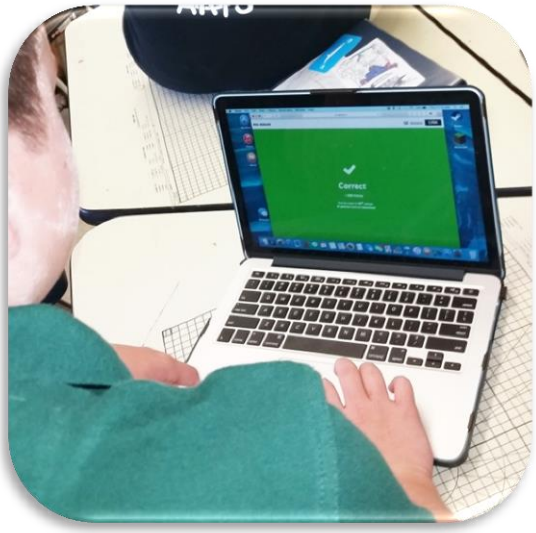
Many teachers see multiple-choice questions as limited to testing students' recall of facts. However, multiple-choice clicker questions can actually serve many other purposes in the class, including assessing students' higher-order thinking skills. Since clicker questions can be used not only to assess students but to engage them, some very effective clicker questions are quite different than multiple-choice questions that might appear on exams.

- Recall Questions: These questions ask students to recall facts, concepts, or techniques relevant to class. They are often used to see if students did the reading, remember important points from prior classes, or have memorized key facts.

- Conceptual Understanding Questions: These questions go beyond recall and assess students' understanding of important concepts. Answer choices to these questions are often based on common student misconceptions, and so these questions work well to help instructors identify and address their students' misconceptions. Questions asking students to classify examples, match characteristics with concepts, select the best explanation for a concept, or translate among different ways of representing an idea are examples of conceptual understanding questions.

- Application Questions: These questions require students to apply their knowledge and understanding to particular situations and contexts. Application questions often ask students to make a decision or choice in a given scenario, connect course content to "real-world" situations, implement procedures or techniques, or predict the outcome of experiments or even their peers' response to a subsequent question.

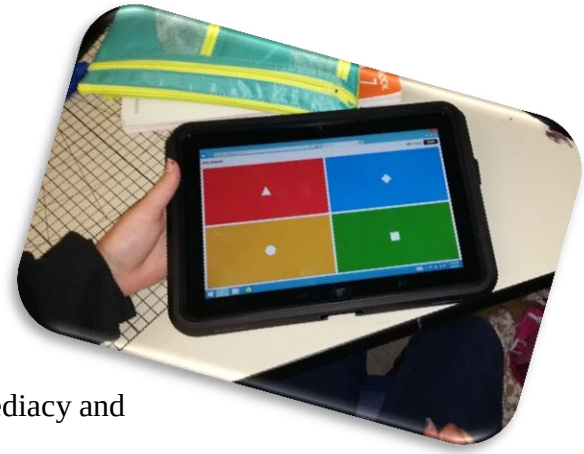
- Critical Thinking Questions: These questions operate at the higher levels of Bloom's Taxonomy, requiring students to analyze relationships among multiple concepts or make evaluations based on particular criteria. Often these questions are "one-best-answer questions," questions that include multiple answer choices that have merit. Students are asked to select the one best answer from these choices. These questions can be very effective in preparing students to engage in class discussions about their reasons.



- Student Perspective Questions: These are questions that ask students to share their opinions, experiences, or demographic information. These questions do not have correct answers, but by surfacing the various perspectives of students in a class, they can help both instructors and students better understand those perspectives. The anonymity that SRS provide is often an essential ingredient in asking these kinds of questions.

- Confidence Level Questions: Asking students a content question, then following that by asking students to rate their confidence in their answers (high, medium, or low) can enhance the usefulness of information on student learning provided by the first question. Prompting students to assess their confidence can also aid in metacognition–learning about one's own learning.

- Monitoring Questions: These are questions designed to provide instructors with information about how their students are approaching the learning process in their courses. For instance, one week before a paper assignment is due, instructors might ask students whether or not they have completed rough drafts as a way to gauge their progress. Asking students how long they took to complete an assignment they have just turned in can provide instructors with useful information about the difficulty of the assignment.



- Classroom Experiments: Student response systems can also be used to collect data from students for classroom experiments often used in the social sciences. Often data generated by students during class can be used to make points about social behavior. By allowing these data to be collected and analyzed during class, SRS can bring a sense of immediacy and relevance to these kinds of experiments.

Variation of the Theme: Types of Activities

Teaching with a SRS can take a number of directions. Teachers will want to match activities to course content, time constraints, learning objectives, and their own teaching styles. Some possibilities for SRS activities include the following, listed more or less in order of increasing levels of student engagement.

- Attendance: SRS can be used to take attendance directly (e.g. asking students to respond to the question "Are you here today?") or indirectly by determining which students used their SRS during class.

- Summative Assessment: SRS can be used for graded activities, such as multiple-choice quizzes or even tests. Some allow for a "student-paced" mode in which students answer questions on a printed test at their own pace.

- Formative Assessment: SRS can be used to pose questions to students and collect their answers for the purpose of providing real-time information about student learning to both the instructor and the students. Students can use this feedback to monitor their own learning, and instructors can use it to change how they manage class "on the fly" in response to student learning needs.

- Homework Collection: Some brands of SRS allow students to record their answers to multiple-choice or free response homework questions outside of class and submit their answers via the SRS at the start of class.

- Discussion Warm-Up: Posing a question, giving students time to think about it and record their answers via SRS, and then displaying the results can be an effective way to warm a class up for a class-wide discussion. Compared with the approach of taking the first hand that is raised after a question is asked, this approach gives all students time to think about and commit to an answer, setting the stage for greater discussion participation.

- Contingent Teaching: Since it can occasionally be challenging to determine what students understand and what they do not understand, SRS can be used to gauge that in real-time during class and modify one's lesson plan accordingly. If the SRS data shows that students understand a given topic, then the instructor can move on to the next one. If not, then more time can be spent on the topic, perhaps involving more lecture, class discussion, or another clicker question.

- Peer Instruction: The teacher poses a question to his or her students. The students ponder the question silently and transmit their individual answers using the SRS. The teacher checks the histogram of student responses. If significant numbers of students choose the wrong answer, the teacher instructs the students to discuss the question with their neighbor. After a few minutes of discussion, the students submit their answers again. This technique often (but not always!) results in more students choosing the correct answer as a result of the peer instruction phase of the activity. This is a fairly simple way to use SRS to engage a large number of students in discussions about course material. This approach can also set the stage for a class-wide discussion that more fully engages all students.

- Repeated Questions: In the peer instruction approach described above, students respond to a given question twice–once after thinking about their answer individually and again after discussing it with their neighbor. Teachers can ask the same question several times, with different activities in between rounds of voting designed to help students' better answer the question. For instance, the students answer the question individually, then discuss it with their neighbor and respond, then participate in a class-wide discussion and respond, and then listen to a mini-lecture on the topic and respond.
- Question-Driven Instruction: This approach combines contingent teaching and peer instruction. Lesson plans consist entirely of SRS questions. Which questions are asked depends entirely on how students answer the questions.
- "Choose Your Own Adventure" Classes: In this technique, a teacher can pose a problem along with several possible approaches to solving it–perhaps approaches suggested by students during class. The teacher then has the students vote on which approach to pursue first, then explores that approach with the students.

Information gathered from Bruff, Derek, et al .(2013) Classroom Response Systems, Vanderbilt University Center for Teaching retrieved from: http://cft.vanderbilt.edu/guides-sub-pages/clickers/#what

Resource List

Socrative (http://socrative.com/) uses cell phones and or laptops (user's choice) for gathering feedback from students. You can post as many questions as you like in a variety of formats.

Kahoot (https://getkahoot.com/) is a service for delivering online quizzes and surveys to your students. The premise of Kahoot is similar to that of Socrative and Infuse Learning. On Kahoot you create a quiz or survey that your students respond to through any device that has a web browser. Your Kahoot questions can include pictures and videos.

The powerful features of Promethean's (http://support.prometheanplanet.com/) ActivEngage2 (for tablets, mobile devices or computers) offer a wide variety of question and answer types, including the ability to assign full quizzes with questions of varying difficulty and enable pupils to respond at their own pace. ActivEngage2 can be used on most any computer, mobile device or tablet. Ready-made interactive lesson resources and student response systems allow you to spend more time where it counts, addressing students' needs. This is not free but many schools have the software.

Poll Everywhere (http://www.polleverywhere.com/) is a service that allows you to collect responses from an audience via text messaging. The free plan for K-12 educators provides selection of features and quantity of responses that is adequate for almost any classroom.

Soap Box (http://www.gosoapbox.com/) is a new service that enables teachers to gather instant feedback from students through their cell phones, tablets, or laptops. Soap Box offers nine useful functions for teachers and students.

Google Forms (https://www.google.com/intl/en/docs/about/) Create custom forms for surveys and questionnaires at no extra cost. Gather everything in a spreadsheet and analyze data

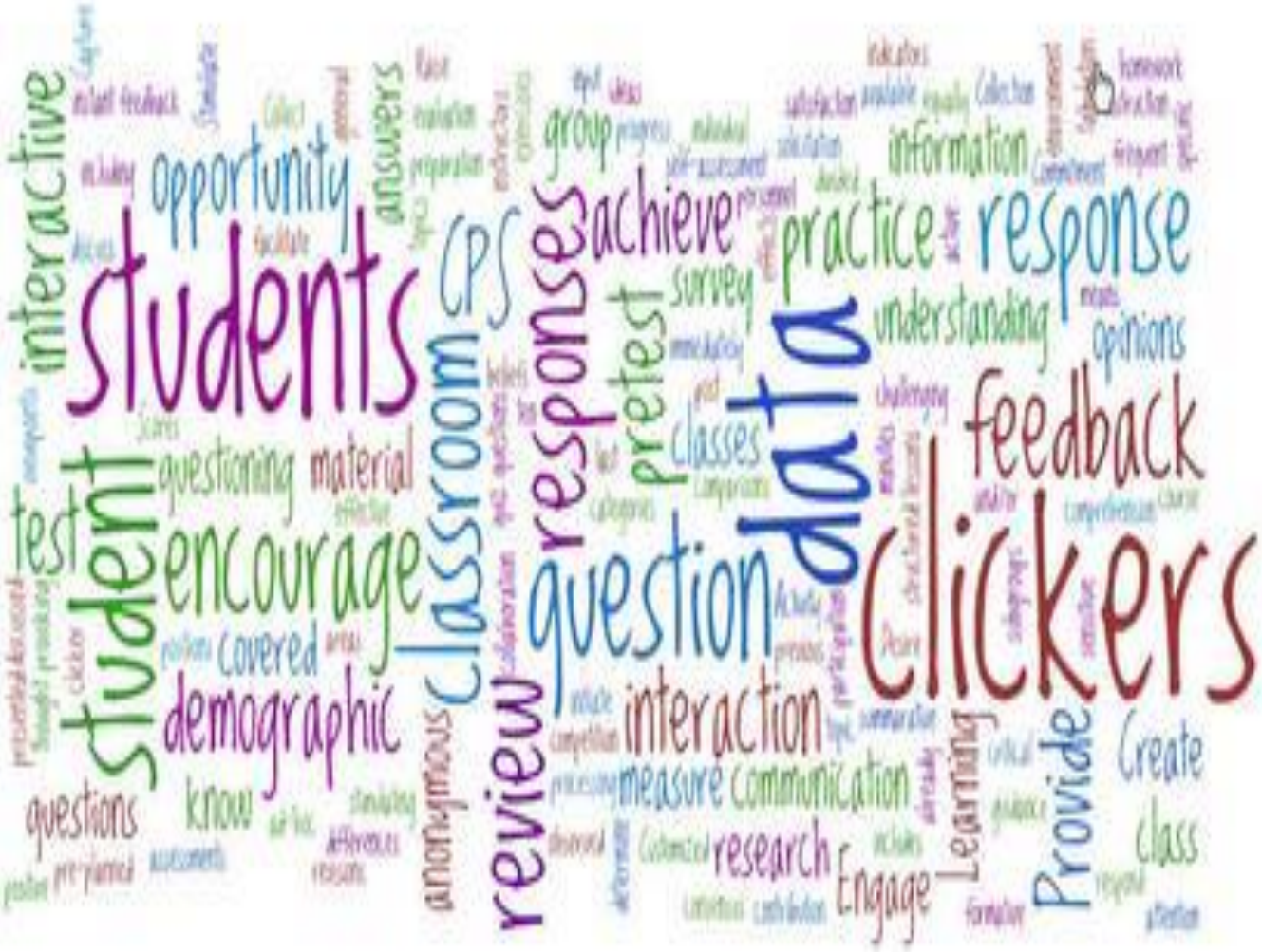
right in Google Sheets. Google Docs provides a free way to collect responses called Forms. The teacher creates a questionnaire for students to complete. Questions can be multiple choice, true/false, short answer, essay, or a scale. Once the form is completed, Google provides a very long URL that is much to long for anyone to manually type. So, forms can be linked from or embedded in a class web page. Alternatively, a URL shortener like j.mp, bit.ly, or tinyurl.com can be used to create a shorter web address that redirects to the obnoxiously long one. This way students can simply type the short URL in their device's browser to access the questions. The responses are collected in a spreadsheet the teacher accesses online. Google makes it easy to see responses in graphs by simply choosing Show summary of responses from the Form menu. With a Google Form, students are not required to respond at the same time. The questionnaire is online and ready for them any time they ready.

Exit ticket (http://exitticket.org/?gclid=CPLHlITOvMYCFYsWHwodz5sAVQ)

Real-time responses for every student allows you to differentiate instruction and provide immediate intervention for every student. See performance & progression metrics for each individual student and the class as a whole, in real-time

Quiz Socket (http://www.quizsocket.com/) is a tool developed for the purpose of enabling teachers to quickly gather feedback from students. Quiz Socket enables students to respond to questions through their cell phones, tablets, and laptops. QuizSocket lets you run a quiz in a class room in real-time. You are asking the questions either verbally, on the board or on slides, and QuizSocket collects the answers from the students.

Verso (http://versoapp.com/) is a free service that offers a nice way to deliver flipped lessons to students and gather feedback from them. As a teacher you can create Verso classrooms that your students join. In your classroom you can post videos, links, and files from your Google Drive account.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