WHITE PAPER

Using Technology to Deliver Engaging Feedback

Summary: This paper reviews the keys to effective feedback, the challenges to delivering it, and how technology can help instructors deliver timely, engaging feedback with the power to significantly affect greater learning.

— Erik Willey, 08/16/17

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Introduction

Providing effective feedback is one of the most meaningful ways an educator can impact student learning. Decades of research have indicated that less instruction plus more feedback is a winning formula for creating greater learning.[1] While it may seem to be a simple, straightforward concept, making feedback truly impactful has often eluded even the most dedicated educators.

Challenges

Feedback for classroom learning has been defined by leading researchers as "information allowing a learner to reduce the gap between what is evident currently and what could or should be the case."[2] That is, information about how a student is doing in his or her efforts to reach a goal. They note, however, that real-world education scenarios often don't live up to this ideal. The disparity between teacher and student perceptions about feedback offer insight: While teachers frequently claim that they routinely give a lot of helpful feedback, trained classroom observers reported seeing very low levels of teacher-to-student feedback. The students themselves reported receiving very little feedback from their teachers, no more than "a few seconds a day."[3]

A significant challenge to delivering effective feedback is knowing, and avoiding, what feedback isn't. Education pros have acknowledged struggling to understand the concept and much writing on feedback discusses it without attempting a definition of best practices.[4] While the term is often used to mean any type of commentary made after a performance, action or assignment, feedback with the ability to result in improved learning has very specific characteristics.

Here are some things it isn't:

- **A grade or score.** B+ or 67% provide no information on how to improve.
- **Value judgments.** "Good" "bad" or "interesting!" don't count as actionable feedback.
- **Advice.** Opinions, guidance and general recommendations are too vague.
- **Assessment.** May provide broad comparative data about student learning but no real direction.
- **Evaluation.** This is judgmental and comparative and often identifiable by heavy use of adverbs and adjectives.
- **Praise.** Positive pats on the back feel good but lack actionable detail.

What the above responses to student work have in common is that they lack the ability to fundamentally improve performance. True feedback, on the other hand, is information crafted with the sole aim of improving performance.

A Word About Feedback vs. Assessment

The power of feedback rests in its ability to deliver useful information throughout the learning process. Assessment, as generally understood, is administered at the end of the process, to determine the extent of learning compared to a standard or benchmark. To confuse matters, feedback may also be referred to as "formative assessment" – that is, ongoing monitoring and commentary that can be used by both students and instructors to improve and adjust their approach. This is distinguished from "summative assessment" – that which is given as an evaluation at the end of an instructional unit or as mandated standardized testing. Formative assessment usually qualifies as true feedback; while summative assessment almost always doesn't, information from summative assessments can be used formatively when used by students or educators to guide their efforts in future activities.

The Building Blocks of Effective Feedback

Although feedback is one of the strongest influences on learning and achievement, the type of feedback provided and the way it is delivered results in varying degrees of effectiveness.[5] For example, studies have shown that when feedback is predominantly negative, it can discourage student effort and achievement.[6]

To be effective at generating a high degree of learning, feedback should be:

- **Goal-Referenced.** The ability to provide helpful feedback first requires that the student is working toward a defined, understood goal. Effective feedback will then relate to that goal, offering insight into whether the student is on track or needs to change course.
- **Tangible and Transparent.** Useful feedback delivers clear, specific details about how to better move toward a goal. It is so concrete and specific that anyone with the same goal can learn from it.
- **Actionable.** Effective feedback provides concrete information upon which students can act to alter their results. By contrast, vague or value-based statements such as "Well done" or "Incorrect" do little to help students understand why they did well or what they should do to do better.
- **User-Friendly.** Feedback should be carefully crafted and delivered in a way that makes it understandable and accessible to the audience, be it an entire class or individual learners.
- **Timely.** Receiving feedback while their efforts and results are still fresh in students' minds increases its impact.
- **Ongoing & consistent.** Improving performance requires the opportunity to receive feedback, try again, then receive additional input. Consistent, accurate feedback lets students successfully react to and adjust work based on that feedback – the essence of formative feedback.

**Case in Point:
Effective Feedback in Action**

The typical lecture-driven course often produces less-than-optimal learning.

Harvard Physics professor Eric Mazur came face-to-face with this fact when he realized that while his students were doing well with textbook-style problems, they floundered when it came to applying this knowledge to other situations. After some soul-searching and exploration, Mazur developed the peer instruction model that is the foundation for today's understanding of active learning. Now, Mazur rarely lectures to his 200 introductory physics students. Instead, he gives them problems to think about individually then discuss in small groups. This, writes Mazur, "provides frequent and continuous feedback (to both the students and the instructor) about the level of understanding of the subject being discussed." This, he goes on to say, produces gains in both conceptual understanding of the subject and problem-solving skills.

Less "teaching," more feedback equals better results.[8]

Each of these qualities of effective feedback is critical to success. It is particularly important to note that even if feedback refers to a goal, is tangible, actionable and delivered in a way that is meaningful to the recipient, it is bound to fail if it isn't delivered consistently and close to the time the effort is made. For more in-depth discussion of each of these characteristics of effective feedback see the article referenced; detailed examples based on telling a joke, hitting a baseball and teaching do a great job providing greater insight into the qualities of great feedback.[7]

Engaging Feedback: How Technology Helps

Providing appropriate, frequent, actionable feedback that students engage with and employ is no small challenge for educators, and studies suggest it's not happening nearly enough. In fact, a comprehensive review of the literature on feedback in higher education revealed that current feedback practices aren't working.[9] Happily, for those seeking to hone feedback skills and foster greater learning, the review also highlighted a growing number of studies that demonstrate technology's ability boost student engagement with feedback. This suggests that changing the process by which feedback is made available to students can increase student attention, engagement and follow through.[10]

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Inspired instructors have been intuitively seeking innovative ways to use tech to enrich their communication with students. This trend is set to escalate as evidence for the positive impact of tech on feedback mounts and younger, tech-savvy educators enter the classroom. With focused professional development and added experience, seasoned educators will push this trend forward as well as they become more comfortable with today's teaching tools.

Some of the most-used and most-effective ways to leverage technology to deliver feedback include: electronic publishing, audio capture, image plus audio, computer assisted assessment, live polling, and blogs/other peer activities.

Electronic publishing

Several studies have demonstrated increased learning impact when feedback is provided electronically. This may be due to the greater flexibility provided, which enables students to focus on and digest comments at a time of their choosing, in the absence of their peers. Typed responses are also often more legible than written comments, and can be less ambiguous than feedback delivered face to face. Electronic feedback also makes it easy for students to refer to cumulative comments as they move through the curriculum.[11] Student affinity for electronic communications may also engender greater engagement with this type of feedback.

Teaching tip:

Many tools are available to aid in delivering digital feedback. Google Docs is a prime example many educators are familiar with; Microsoft Word also enables quick, easy-to-read commentary. Beyond the basics of typed comments, try color-coding different types of corrections to make it easy for both you and your students to quickly visualize the most common types of errors. Distributing feedback is easy in Google classrooms; if yours isn't one try a service like Dropbox that will notify students when you've made changes or comments to an assignment.

Audio feedback

No time to meet one-on-one to discuss student progress? Digitally recording audio feedback lets instructors provide more detailed feedback that may be particularly engaging for auditory-learners.[12] Short on time for typing detailed responses? Even detailed verbal feedback is faster and can be more thorough. Digital audio files can expand simple written feedback like "incorrect sentence structuring" to a detailed explanation of what was wrong and how to correct it. Plus, struggling students can listen to comments as many times as needed throughout the term to boost their understanding.

Visual + audio

Video screen capture, also known as screencasting, combines the power of visual data and audio narration to deliver a powerful dose of engaging feedback that students can save and refer to as needed. Screencasts, which capture the content on your computer screen while you narrate along, are great tools for providing feedback, creating tutorials or showcasing student mastery. Creating YouTube videos to provide feedback and using Skype to conduct student project interviews are other ways to leverage the visual and verbal for greater learning.

Computer-assisted assessment

The feedback provided during computer-based formative assessment activities can be highly engaging, as students receive instant feedback throughout a learning activity. This approach has become increasingly popular at all grade levels and within virtual learning environments.[13] A crop of online and cloud-based formative feedback tools has sprung up to support these efforts. (See Formative Feedback & Technology below.)

Teaching tip:
For quick, easy recording, try apps like Evernote, Desire2Learn and Vocaroo to record and send audio feedback to save time or when extra info is needed to get your point across. Your interactive whiteboard may also be able to help – some IWBs include integrated audio-capture along with screen saving capabilities.

Teaching tip:
Screencasting is a great way to deliver whole-class reinforcement as well as individual feedback. Try taking screencasts of assignments with an audio narrative that identifies and explains the correct and incorrect ways of tackling the goals. Popular screencast sites include Jing's and Screencast-o-matic and some classroom interactive displays, such as ViewSonic ViewBoard, support screencasting with proprietary software included. A great tool for screencasting, Quicktime comes free as part of the Apple OS. Visit this link for a host of ideas, rubrics and tools for creating screencasts: http://www.schrockguide.net/screencasting.html.

Teaching tip:
GoFormative, Socrative and the other teacher-recommended tools noted below deliver powerful real-time feedback, whether used as whole-class tools on your interactive white board or on 1:1 devices.

Live polling

Classroom response systems – commonly known as "clickers" – have been shown by numerous studies to create a more dynamic, interactive classroom experience that results in an increase in attendance, participation and learning.[14] Hand-held transmission devices similar to TV remote controls, clickers enable each student to submit real-time responses that provide instructors with instant insight into levels of understanding – enabling them to then respond with relevant feedback.

Blogs & other peer activities

Educators have found that student performance often improves after providing and receiving feedback to/from peers. Technology provides an ideal tool for expanding this pedagogical approach.[15] Blogs on any topic are a great way to encourage writing practice and facilitate peer feedback opportunities.

Teaching tip:

Just getting started with clickers? Try using them first for grading and attendance, then dive into formative assessments and comprehension checks. They're a great way to create interaction around sensitive subjects and help shy students participate.

Teaching tip:

Try combining free-choice topics with blog assignments to boost enthusiasm. See this referenced article for insight into how to begin the process that resulted in improved writing skills and enthusiasm in this instructor's class.[16]

Formative Feedback & Technology

Using classroom tech to access apps and cloud services designed specifically to deliver formative feedback helps shorten the feedback loop, rendering feedback more meaningful to students and faster and easier for teachers to offer up. Formative, a favorite among ViewSonic educator partners, is one such tool. Available for download at goformative.com, this free cloud-based service lets teachers create assignments, deliver them to students, receive results, and provide individualized feedback in real time. Teachers can upload pre-existing documents or use the platform to create paperless assignments from scratch. Easy to setup and use, Formative runs on any internet-connected device.

ViewSonic education partner, leading EdTech influencer, and author of Ditch That Textbook, Matt Miller, uses and recommends Formative for its ability to give students meaningful feedback while they're still in the moment, making them more likely to engage with the feedback and put it to good use:

> "Formative gives you great flexibility. You can create different types of questions, add text blocks, images, YouTube videos – then students fill in answers and can even draw an answer, which is great for math and science. The beauty of all this is that you can see students work in real time and when they're logged into their student accounts you can type them a comment they'll see instantly, in the moment while they're still cognitively wrestling with the subject."

Other popular formative assessment tools include: Socrative, Kahoot. Zaption and Backchannel Chat Tools. Classrooms without 1:1, BYOD or clickers can accomplish polling for feedback with Plickers and QuickKey.[17]

Using Interactive Whiteboards for More Engaging Feedback

Interactive whiteboards (IWBs) empower instructors to address two of the most critical components of feedback: keeping it timely and consistent.

When used with interactive learning apps (the options are virtually endless; think MathPlayground, PBS KIDS apps, DuoLingo and Tiny Cards), students working at the board receive immediate responses that tell them how they're doing. Quick action and repetition allow them to try again for the consistent, ongoing input critical to turning feedback into learning – exactly what's needed, as articulated by one formative assessment expert:

> "Adjusting our performance depends on not only receiving feedback but also having opportunities to use it…. Thus, the more feedback I can receive in real time, the better my ultimate performance will be. This is how all highly successful computer games work. If you play Angry Birds, Halo, Guitar Hero, or Tetris, you know that the key to substantial improvement is that the feedback is both timely and ongoing. When you fail, you can immediately start over—sometimes even right where you left off—to get another opportunity to receive and learn from the feedback."[18]

Add polling devices to the use of an IWB and you have a means of gathering individual, real-time responses that can then be responded to with individualized feedback or group feedback addressing the various categories of misunderstanding revealed by the polled responses.

Interactive boards with the ability to record on-screen content provide another easy way to deliver ongoing feedback. Instructors can save files that include feedback written on the board during a lesson and send the file to students for later review and reference. With an exclusive audio-record function, ViewSonic ViewBoard enables the inclusion of verbal instructor and peer feedback along with on-screen info capture. ViewSonic exclusive Direct-to-Google-Drive Save makes it even easier to share ViewBoard feedback files in Google-based classrooms.

Finally, IWBs with the ability to import virtually any type of online learning tool or app facilitate the delivery of user-friendly feedback customized to the needs of any classroom level and degree of mastery.

A Case for Formative Feedback: Knowing What They Don't Know

While teaching a challenging computer science concept, educator Vicki Davis experienced the teacher-student feedback perception gap in a way that forever changed her thinking about formative assessment.

After reviewing how to count in binary numbers, two students exclaimed, "We've got this! Let's move on." Davis queried the classmates, who nodded their heads and agreed that they too understood the concept. Although her instincts told her the class was ready to move on, Davis decided to test her gut by using the formative assessment tool Socrative, which is similar to Formative discussed above. Davis wrote a problem on her IWB and the student answers appeared alongside their names. Only two students provided correct answers. Davis was then able to execute on the ideal of formative assessment – keeping it ongoing and in the moment. She taught for a bit longer, retested, and continued the process until everyone had mastered the problems.

While this may sound time consuming and laborious, it was far from it. In keeping with her practice of sticking with the subject until all students scored 90% or higher on the test, Davis was able to complete the binary number instructional unit two days faster than usual. Plus, not a single student needed to come in for after-school tutoring. Said Davis, "I'm sold," adding in her blog that "Test scores should never be a surprise. You don't need to be a mind reader. You just need a formative assessment toolbox, and you need to use it every day."

Source: https://www.edutopia.org/blog/5-fast-formative-assessment-tools-vicki-davis

Conclusion

Providing students with the right type of feedback, at the right times and with an optimal degree of frequency is one of the most important things educators can do to ensure that their instructive efforts take root. Crafting feedback that is goal-referenced, tangible, actionable and accessible, then delivering it in a timely, consistent manner will maximize its impact on learning outcomes. Technology offers many options for enhancing the delivery of truly effective feedback. Interactive whiteboards, formative feedback apps, classroom response systems, electronic publishing and audio capture are among the tools educators can leverage to more fully engage students with feedback. ViewSonic ViewBoard interactive displays include exclusive features like audio record and one-touch save to Google Drive that further enhance instructor's' ability to deliver timely, engaging and truly effective feedback

For more information, contact ViewSonic sales at salesinfo@viewsonic.com or visit www.viewsonic.com

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