LEARNERS SEEK FEEDBACK

and Recognize That Errors Are Opportunities to Learn

LEARNING INTENTION

We are learning to create opportunities for learners to seek feedback and recognize that errors are opportunities to learn.

SUCCESS CRITERIA

- I can explain empathetic feedback.
- I can describe the five aspects of the GREAT feedback framework.
- I can identify the four types of feedback.
- I can create feedback opportunities and model seeking feedback.
- I can describe the learning outcomes of the four possible learning events.

Students who reliably gauge their own progress not only seek but are receptive to receiving copious amounts of feedback. As we noted in the last module, they develop a feedback loop by engaging in reflective self-questioning and taking action, thereby becoming more metacognitively aware. In addition to monitoring their own progress, students who drive their learning seek feedback—they do not wait passively for feedback. Peers are an important, yet often untapped, source of feedback, particularly when students engage in peer critiques. And teachers are a major source for feedback. But not all feedback is useful. First, it needs to be timely. It's remarkable how quickly feedback gets stale. In addition, it should be specific and actionable, meaning that students can apply the feedback to revise their work. Saving your very best feedback for the summative assignment is a waste of your time and theirs if students don't have an opportunity to act upon it.

Students who drive their learning seek feedback; they do not wait passively for feedback.

But just because teachers provide copious amounts of feedback does not mean that students hear, understand, or can act on this feedback. Many consider feedback to be a "cost"—they have to do more or do the work again; it was not good enough. It becomes a skill for them to "not hear" feedback, as it is for us adults. Also, too often feedback comes at the end of a piece of work, and there is no opportunity to act on any feedback—so why bother listening to it? And even when students "hear" the feedback, do they understand it? It is a fascinating exercise to ask students to make notes on the feedback they receive, so you as the teacher can "hear" how they understand your feedback. (Be prepared—some will note nothing despite a half page of your comments—this is feedback to you that your feedback was not received or understood.)

Finally, can the student act on the feedback, and does the student do so? Like the proverbial tree in the forest, if your feedback is not acted on, was it truly feedback? Teaching students how to hear, understand, and act on feedback can be critical, as it is for you to hear, understand, and see whether your feedback is acted upon. When we are asked what good feedback is, the simple answer is that good feedback is the feedback you provided that was acted upon.

With all the emphasis on feedback, it is important to note that the ultimate arbiter of its usefulness is the receiver, not the giver. The student determines whether the feedback is understandable, meaning the teacher must be attuned to feedback language. If a student doesn't understand the feedback a teacher gives, then it isn't useful. Period.

Perceptions about feedback are influenced by cultural and personal factors specific to the learner, to be sure. Gee (2014), in a study of the effects of teacher feedback on writing, noted that there are three main effects: "saying, doing, and being" (p. 3). The feedback we provide to students tends to be consciously focused on what is said and what we want them to do next. But as educators we may not always perceive its effect on student identity—the "being" dimension of Gee's feedback frame. The notion of *feedback literacy*, in which teachers and students understand the elements, effects, and purposes of feedback, has been forwarded by many researchers (Ketonen et al., 2020; Mandouit & Hattie, 2023; Sutton, 2012).

Consistent with the dimensions of developing students' ability to drive their learning, Carless and Boud (2018) outlined four dimensions of student feedback literacy:

- **Appreciating feedback** as a means to strengthen their learning, while also understanding that feedback comes in a variety of forms and sources. In addition, they know that storing and returning to the feedback will enhance their efforts
- **Making judgments** so they can accurately judge their own work and the work of peers, and participate in peer critique opportunities
- **Managing affect** to avoid being defensive, and make it a habit to seek feedback from others
- **Taking action** is a product of the first three, in that students must act upon the feedback and have a repertoire of strategies to do so.

However, the effectiveness of developing *student* feedback literacy is balanced by the *teacher's* feedback literacy. Carless and Winstone (2023) studied this interplay and noted that teacher feedback literacy is expressed through the following deliberate actions:

- A design dimension that focuses on designing feedback processes for student uptake and enabling student evaluative judgment
- A pragmatic dimension that addresses how teachers manage the compromises inherent in disciplinary and institutional feedback practices
- A relational dimension that represents the interpersonal side of feedback exchanges

Feedback should help students become more consciously aware of what they are doing, their decisions for doing so, and what problem-solving strategies and processes they can use to correct, revise, or improve their work.

This last element is a major factor and speaks to the inherent importance of the student's positive relationship with the teacher. Relational trust is an important element of teacher credibility. And examination by Zumbrunn et al. (2016) of middle and high school students' perceptions of feedback about their writing noted that students' relationship to the teacher had a mediating effect. While most of the student respondents (80%) said they liked receiving feedback about their writing, 20% did not. Among those who had a negative perception, 65% of student comments disregarded the source of the feedback (the teacher) and expressed indifference to the value of feedback for them:

- "If I'm happy with my writing, their opinion doesn't matter."
- "It's annoying."
- "I don't really care."
- "I'm really not interested in getting feedback."
- "Some teachers are mean."
- "I don't like writing and [teachers] are really critical, so I just say whatever and keep writing."

A related study of elementary students drew similar conclusions. Children drew pictures of themselves writing in the classroom and discussed their perceptions. Some students' negative perceptions cited isolation from the teacher, and those students stated that they experienced anxiety about or physical or emotional pain associated with their writing (Zumbrunn et al., 2017).

At its best, feedback should help students become more consciously aware of what they are doing, their decisions for doing so, and what problem-solving strategies and processes they can use to correct, revise, or improve their work. It isn't enough to provide instruction on strategies; we must link them to the self-regulation the learners can exercise to gauge their progress and move forward. Our own feedback literacy is the link between the two.

Feedback must be seen as a two-way street.

TEXT IMPRESSION

Use the following words (in any order that works for you) to create an impression about what you think will be covered in this module.

praise • feedback received • empathetic • monologue • capacity building • help seeking • unproductive success

Feedback has been described as the most underutilized instructional approach teachers have at their disposal. Teachers will often say that they know feedback is useful, but they offer *useful* feedback surprisingly infrequently, with most incidents consisting of general praise of a nonspecific nature ("You've done a fantastic job!"), and usually only one or two sentences in length (Voerman et al., 2012). It truly is a lost opportunity as

well, since the effect size of feedback is 0.62. Perhaps it is effective because it encapsulates many of the sound approaches detailed throughout this playbook. The purpose of feedback should remain constant—to progressively close the gap between present and desired performance or learning. To do so, the teacher and the student must have

- The ability to determine the present level of performance (Module 2)
- A clear and shared understanding of the learning intentions and success criteria (Module 3)
- Strategies and processes that can be put into action (Module 4)
- Ways to gauge the next steps to move forward (Module 5)

Importantly, feedback must be seen as a two-way street. Teachers provide feedback to students and in turn gain feedback from students. After all, students' work, understandings, questions, misconceptions, and errors are all feedback to us about our performance. Therefore, feedback should not be viewed as a one-way transmission model, but as one that operates dynamically between teacher and student.

NOTES

CONNECTIONS

We noted the overall effect size of feedback at 0.62. But there are many aspects of feedback that have different effect sizes. Note each of these and how you might use them in your classroom.

Aspect of Feedback and Effect Size	Definition	How I Might Use This . . .
Feedback from tests (ES = 0.48)	Feedback is given based on testing; using evidence from the test to give feedback	
Using reinforcement and cues for feedback (ES = 0.92)	Positive and negative reinforcement and cues to advance to next steps in learning	
Feedback using technology (ES = 0.61)	Using technology tools to deliver feedback for students	

attends to the quality of the relationship. The GREAT feedback framework consists of five facets:

- **Growth oriented:** It signals one's intention as constructive and focused on improvement rather than criticism.
- ***Real:*** The feedback is honest, targeted, and actionable; not holistic, vague, or false praise.
- ***Empathetic:*** It combines critique with care and a quest for mutual understanding.
- ***Asked for:*** It encourages the receiver to ask questions and seek feedback.
- ***Timely:*** Feedback gets stale fast, so you want to make sure it is delivered soon.

Let's take each one of those dimensions and play it out with a student. As you read the following section, consider it in the light of feedback literacy on the part of the teacher and the student. The goal is to ensure that students know where they are going next in their learning and how to get there.

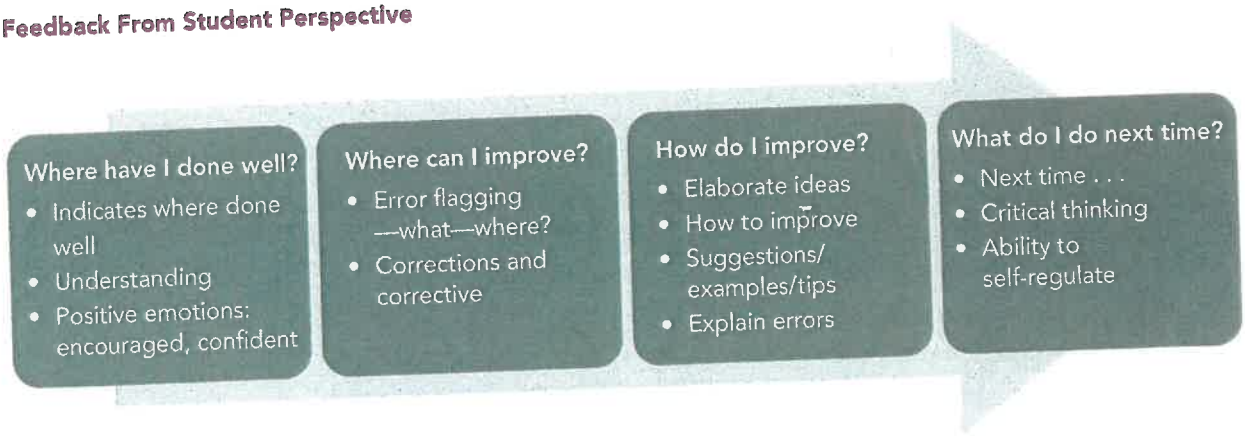
Real feedback includes rich information that provides the learner with details about what to start, continue, and change.

Growth Oriented

Start with your intention to provide feedback such that it meets this first condition. Ask yourself, are you ready to provide growth-producing feedback, or are you still in a place of criticizing? If you are not yet ready to move from criticism, it's not time for feedback. For instance, middle school English teacher Taylor Hayden sits next to a student and begins, "Saylor, I noticed that you've been working on your essay revision, and you added your name to the list of people ready for feedback. Is this a good time for some feedback so that you can make the most of your additions?"

When we asked students what they understood by feedback, their answers were pretty consistent. For students, feedback is the answer to the question "Where to next"?

Feedback From Student Perspective



Real

Information-rich feedback provides the learner with details about what to start, continue, and change. This information needs to be actionable and honest. All of our students have received false praise, and it's not helpful. Real feedback is also not only corrective ("This one's right and that one's wrong"). Rather, it gives the learner information about the task, the process, and perhaps their self-regulation. The teacher begins by stating something to continue. "You're effectively showing your thinking on

paper with your thesis statement. One thing to start doing is to restate one important idea at the beginning of each of the next paragraphs. One thing to stop is to say the thesis statement again at the end of each paragraph, because it's not necessary for your reader. I have to add, your persistence in making this a polished piece really shows." It's important not to overwhelm the learner with more feedback they can process at a given time. Notice that the teacher focused on the thesis statement and how it plays out in subsequent paragraphs.

Again, we note the difference between effective feedback at the task level and at the deeper level. Feedback focused on correct-incorrect response is more powerful at the task level. The example above includes feedback that supports students at the deeper level of learning.

Empathetic

It's easy for feedback to be reduced to lots of "you" directives. Be sure that the feedback also contains "I" messages that foster empathetic listening, as the evidence is that we listen more effectively when someone uses this pronoun. This can reduce that initial defensive clench that might otherwise shut down the conversation before it has begun. "When I read your draft essay, I can already see how effective your thesis is. For me as a reader, the reminders about your thesis help me to join you in your argument," says the teacher. The message is to show the student you have heard what they are aiming to say or do, and this increases the probability that students will then listen and understand the subsequent feedback.

Adding some "we" statements to the feedback can demonstrate for students that their teacher (or peers as they learn to incorporate the GREAT feedback model) empathizes with them and their learning journey. For example, Ms. Hayden adds, "We can review a few examples from other writers together if that's helpful, or we could record some peer responses and listen to them together."

Asked For

Effective feedback is a dialogue, not a monologue. Simply blasting a student with lots of feedback isn't likely to foster a relationship. The content of the feedback is based on what the student is asking about. The students in Ms. Hayden's class add their names to an electronic database when they are ready for feedback and include items that they'd like to focus on during the conversation.

The content of the feedback needs to be based on what the student is asking about.

After providing microfeedback, invite the student to ask questions. "What questions do you have for me? Is there anything you're confused about?" says Ms. Hayden. Saylor responds, "I thought we were supposed to restate the idea in each paragraph. I know it's on the rubric for this essay. Where do I restate my thesis?" The student's response now becomes feedback to the teacher, who recognizes that for this student, the instruction wasn't clear. The two of them discuss further restating the thesis in the concluding paragraph of the essay.

Timely

This final dimension of feedback doesn't come in the form of a statement, but rather in its relationship to time. As novice teachers, we made the rookie error of saving our best feedback for the end of an assignment, only to witness students checking for the grade and discarding the rest. Imagine what the effect would have been if the conversation between Saylor and the teacher hadn't happened until the final draft was submitted. Make sure that the feedback occurs at a time when it remains actionable.

NOTE TO SELF

In addition to avoiding directives and using "I" statements, several teacher actions increase the sense of empathy on the part of the receiver of the feedback. Consider each of these actions, and identify ways that you could incorporate them into a feedback session with students.

Empathetic Feedback Component	Definition	How I Can Use This . . .
Start with success.	Tell them one thing that they did well.	
Make it manageable.	Use microfeedback to focus on one important but small thing at a time.	
Recruit the receiver.	Switch to a "we" statement following each microfeedback statement.	
Create a culture of appreciation.	Thank the receiver for participating, listening, acting upon, or something else.	
Seek your own feedback.	Obtain feedback about your feedback—the impact, usefulness, or ways to improve.	

TYPES OF FEEDBACK

Remember that the usefulness of the feedback is in the eye of the beholder. Therefore, feedback should address the three major questions learners have (Hattie & Timperley, 2007):

1. Where am I going?
2. How am I going there?
3. Where will I go next?

The first question is addressed through the learning intentions and success criteria. Knowing what success looks like allows students to strive with the teacher to achieve these goals. If the goal, for example, is to write a detailed explanation of factors leading to the failure of the Fukushima Daiichi nuclear reactor in 2011, omitting information from prior safety studies would be an error that would need to be corrected.

That's exactly what chemistry teacher Dennis Eagleton did when he met with a student Sharla to discuss her first draft. "I read your draft yesterday and noted the questions you asked about for feedback. You're off to a great start," he began. "Let's look at this together so we can figure out how best to support your next draft." After identifying strengths in her initial report ("you provided an account of the disaster at the beginning of the paper, which set the context for understanding its magnitude"), he turned his attention to the checklist for the report. "What's missing for me so far is information about any safety concerns prior to the disaster."

Make sure that the feedback occurs at a time when it remains actionable.

Mr. Eagleton then went on to address the second question, which concerns using strategies to address discrepancies. "So let's talk for a few minutes about where we might locate this information. I was thinking that maybe making a list of places to check out is going to prevent you from forgetting the ideas we brainstorm." He and Sharla spend a few minutes discussing possibilities, including checking the Japanese Nuclear Safety Commission and International Atomic Energy Agency websites for information. Because the students in his class were researching nuclear disasters from around the world, including Chornobyl and Three Mile Island, he had curated several appropriate resources on his course learning management system (LMS). However, Sharla had overlooked these resources when developing her initial draft.

Mr. Eagleton then shifted his focus to the third question, addressing Sharla's next steps. "What's next for you? It's important that you have a plan. What two or three things are you going to do?"

Sharla offered, "Well, I've got some reading to do, looking for any safety reports. Once I write up that part, I'm going to have someone else who's not working on Fukushima read it just to make sure it makes sense." And, smiling, she said, "I guess I need to use the checklist a little better, too. Thanks, Mr. E!" With that, Sharla headed back to her research team.

We don't mean to oversimplify feedback by reducing it to a three-step process, but rather to use the process as a frame to make the feedback as useful as possible. For many students, if there is no "where-to-next" feedback, then they often say they received no feedback. In reality, there are four types of feedback that can be incorporated into the model of providing feedback (Hattie & Timperley, 2007). Depending on

the student and the need, feedback may address one or more of four different types. These types of feedback are typically interwoven throughout the feedback process.

The first type is feedback about the task or product. This type of feedback is sometimes called *corrective feedback*, as it provides information about the accuracy or completeness of the assignment. Mr. Eagleton used this type of feedback to highlight what Sharla had included (context) and what she had omitted (safety concerns prior to the event).

Mr. Eagleton also provided a second type of feedback, which was about processes. In his case, he focused on strategies, especially identifying possible resources for her. The teacher also included a third type of feedback, which concerns self-regulation. He asked Sharla about what she would do to support her own critique of her written draft, and she noted that she would consult the checklist a bit more closely and have a peer read her next version to see if it made sense.

Notice that he did not make the mistake of confining his feedback to the fourth type of feedback, which is about the person receiving the feedback. These comments often take the form of praise, usually general and vague, and have very little impact on learning with an effect. Telling Sharla, "You're off to a good start!" without any further information is not helpful to her and would have indicated that the teacher himself hadn't thought deeply about the student's work. We are not suggesting that students should never be praised. But self-efficacy is about confidence in one's capacity and capability. Self-efficacy is drawn from knowing about the specifics, including what has already been accomplished and what should occur next.

We mentioned before that feedback goes both ways, and Mr. Eagleton is attuned to this concept. He kept an informal tally of the errors he saw most commonly, so he could plan for some reteaching the following day. He told the class,

> I talked to several of you who hadn't made use of the checklist before submitting your work to the LMS. Tonight I'm going to change the online protocol so that you can submit a completed checklist with your draft. That should help. I'm also going to update the resources I have online. Several students mentioned great resources they used that were not on the LMS. I made a list, and I'm going to add them so that others can use them. I'll review the new resources at the beginning of class tomorrow.

MODELING SEEKING FEEDBACK

In Ms. Garcia's fourth-grade class, students are learning to internalize the idea that feedback is something to be excited about. She decides to distribute a survey to her students, so she can seek their feedback (Figure 6.1). She tells students that she would appreciate their honesty, because she is excited to have a goal to work on for the quarter. She tells the students, "You have all chosen goals for this first quarter, and I want a goal too. I am always trying to be a better teacher, and I need your help deciding an area I want to work to improve. I have written some questions I would like you to answer."

The next day, Ms. Garcia announced, "After reviewing the surveys, I am so excited to reveal what my goal this quarter will be. I am going to learn more about how to give more practice work that is more helpful and meaningful. I am so excited to take on this goal, and I appreciate the feedback from this class."

Figure 6.1 Feedback for the Teacher

	No 1	Sometimes 2	Yes 3
1. My teacher cares about me.			
2. Every day I get a chance to work with my peers.			
3. My teacher wants to get to know me.			
4. My teacher gives me enough practice to be able to do the work on my own.			
5. My teacher is organized and ready to teach me.			
6. My teacher is excited to teach us.			
7. I feel like I am in control of my learning.			
8. I get to talk to my teacher every day.			
9. My teacher helps me when I need it.			
10. My teacher gives me practice work that helps me learn.			

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MODELING MAKING MISTAKES

At Lakeside Elementary, principal Judy Harper sends out a weekly school video message that teachers show in their classrooms on Monday morning. The weekly message is a great way for students to hear the news for the week and includes a weekly question that students discuss. First-grade teacher Kenneth Youth apologized to his class Tuesday morning for forgetting to play the video yesterday in class. It was the third week in a row that he showed the video on Tuesday after forgetting to show the video on Monday. He said, "I keep making this mistake, and I know that when I make a mistake, it is a chance for me to do something different and learn from my mistake. So, I have an idea."

Mr. Youth showed the class five magnetized pictures of the principal, and he added those pictures to the Monday box of the classroom calendar on the wall. "Now we have a reminder to play our Monday video! Remember that making mistakes means that you are about to learn something new or come up with a great idea!" Later in the week, Principal Harper walked into the room and noticed several pictures of herself on the class calendar.

"Why is my face on the calendar?" she laughed.

Trinity, a first-grade student, spoke up, "Because Mr. Youth made a mistake and mistakes give you great ideas!"

Students want to make improvements, but do not usually know how to ask for specific feedback. The use of success criteria or the single-point rubrics discussed in an earlier module supports students' capabilities and confidence in asking for feedback. Fourth-grade students in Jennifer Reed's classroom have self-assessed their performance using a single-point rubric (Figure 6.2). They rate themselves on the following scale:

1 I am just learning.

2 I am developing my understanding.

3 I understand and can teach others.

Figure 6.2 Self-Assessment of Writing

Rate 1, 2, or 3	Criteria for Success	Evidence
	I can hook the reader with an interesting beginning.	
	I can clearly state my opinion.	
	I can separate my reasons into paragraphs.	
	I can give evidence and examples to explain each of my reasons.	
	I can use transition words and phrases, like "for example," "for instance," "furthermore," and "in addition."	
	I can use high-level words to show I am an expert on my topic.	
	I can capitalize proper nouns and the beginnings of sentences.	

Rate 1, 2, or 3	Criteria for Success	Evidence
	I can put punctuation at the end of each sentence.	
	I can use commas to separate words in a series and before conjunctions.	
	In my conclusion I can write a concluding statement that reminds the reader of my opinion.	

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Ms. Reed explains, "Today we have an opportunity to give and receive some peer feedback. Take some time to review your work and your rubric to prepare for those conversations." Fourth-grade students Sol and Jeremy sit next to each other and begin with Jeremy's opinion essay. Sol says, "I noticed that you have three reasons and you separated them into different paragraphs."

Jeremy looks up at the posted "Giving and Receiving Sentence Starters" (see Figure 6.3) and responds with, "Thank you for noticing that I thought of three reasons for why Nikola Telsa's inventions had more lasting impact than Alexander Graham Bell's." Jeremy continues, "I have my three reasons, but I don't think those paragraphs are long enough. I'm missing examples and details to back up my reasons. I think that's what I want your feedback about."

Figure 6.3 Giving and Receiving Sentence Starters

Giving	Receiving
I noticed that . . .	I appreciate you noticing that . . .
I wondered about . . .	I hadn't thought about that . . .
I was confused by . . .	I heard you say that . . . confused you.
I suggest that . . .	Based on your suggestion, I will . . .
Have you thought about . . .?	Thank you, what would you do?
You might consider . . .	I'm not sure what that looks like; tell me more.

CREATE FEEDBACK OPPORTUNITIES

An essential aspect of self-questioning and goal setting is in seeking feedback and help as needed. Interestingly, help seeking is not associated with helplessness but with empowerment and capacity building (Butler, 1998). In fact, avoiding help is associated with a host of negative learning outcomes, including lower achievement levels, unproductive "wheel spinning" (repeatedly getting something wrong), and poor ability to make accurate judgments about one's learning (Almeda et al., 2017). Help-seeking behaviors of students include asking for explanations to clarify understanding and seeking resources to support their learning. And help seeking has an effect size of 0.72, well worth our instructional attention.

But students don't always seek help or feedback from their teachers. Butler and Shibaz (2014) examined the function of positive student–teacher relationships in help seeking, noting that "whether students turn to a particular teacher depends crucially on whether they believe that the teacher cares about their students' welfare" (p. 50). This makes sense, of course. Any one of us is unlikely to seek help, no matter how much we may be aware of our own needs, from someone who does not appear to be all that caring.

In order for students to seek feedback, teachers need to create the conditions that allow this to flourish.

Help seeking is at the core of soliciting feedback and involves both the academic and social climate. Students who know how to drive their learning reliably and regularly seek feedback about their learning and progress toward goals. But in order for students to seek feedback, teachers need to create the conditions that can allow this to flourish. That means building and maintaining a strong and caring classroom learning climate, one in which students know they can approach teachers and classmates to get feedback.

One's willingness to seek feedback is influenced by prior knowledge. Students with higher levels of prior knowledge seek feedback about processes and understanding solutions, while those with lower prior knowledge seek low-level feedback about whether an answer is correct or not (Almeda et al., 2017). Sixth-grade math teacher Shekar Arya uses a variation of worked examples during small group math instruction to foster peer feedback. After he poses a problem, his students attempt to solve it independently. Mr. Arya examines each solution and then selects his "favorite no"—an incorrect answer containing some good mathematical thinking. "I give the incorrect solution back to the student and encourage them to confer with the other students to do two things. The first is to figure out where the error occurred, and the second is to determine why I selected it as my favorite no," he explained.

Mr. Arya enjoys listening to the feedback students give one another, especially how they offer explanations, ask clarifying questions, and speculate about the mathematical reasoning demonstrated. "As a teacher, I get two things out of it. First, I get to listen to the sophistication of their critical thinking. Second, I can coach them to get even better at peer feedback. I want them to pursue more than the correct answer. I want them to see the value in what they can offer one another."

Feedback is described in this module as "the most underutilized approach teachers have at their disposal." What are some of your areas of success and areas for growth in your use of feedback with students? What actions will you take to seek feedback from your students?

SEEING ERRORS AS OPPORTUNITIES FOR LEARNING (AND CELEBRATING THOSE ERRORS)

Failure can also be productive, especially when it is followed with further instruction and feedback.

Let's get real. No one likes to be wrong. When was the last time you failed at doing something and cheerily reminded yourself, "Now I've got an opportunity to learn!" The failure to accomplish something can be demoralizing and frustrating, especially in the absence of support. However, failure can also be productive, especially when it is followed with further instruction and feedback. Imagine what it would be like if classrooms were places where errors were celebrated as opportunities to learn. Over time, we might all learn to welcome the opportunities that our errors provide us for learning.

Kapur (2016) describes four possible learning events: *unproductive failure* (unguided problem solving), *unproductive success* (memorizing an algorithm without understanding why), *productive failure* (using prior knowledge to figure out a solution, followed by more instruction), and *productive success* (structured problem solving). Of the four conditions, unproductive failure yields the smallest gains, as students' thinking is not guided in any way, and they are just expected to discover what should be learned. Unproductive success is also of limited value, as students in this condition rely on memorization only but don't ever get to why and how this is applied. There's just no transfer of knowledge.

Now let's move to the beneficial conditions: productive failure and productive success. Kapur explains that

> the difference between productive failure and productive success is a subtle but an important one. The goal for productive failure is a preparation for learning from subsequent instruction. Thus, it does not matter if students do not

> achieve successful problem-solving performance initially. In contrast, the goal for productive success is to learn through a successful problem-solving activity itself. (p. 293)

For students to drive their learning, they also need to also experience productive failure.

Both are necessary for learning. In productive success conditions, students are guided to resolve problems (not just memorize formulas). For instance, in a close reading lesson, students approach a complex text that stretches their deep comprehension, as the teacher carefully scaffolds their understanding by posing text-dependent questions that move from the literal to the structural to the inferential. But for students to drive their learning, they need to also experience productive failure. Keep in mind that these are opportunities for students to apply what they already know in an attempt to resolve a problem, with further subsequent supports available to refine their knowledge. These are small but important failures, not the soul-crushing kind that makes students want to throw up their hands in frustration. Figure 6.4 summarizes these types of learning events and their outcomes. To extend our close reading example, students sometimes take on complex texts initially in the company of peers, even if this effort is initially unsuccessful. After students have had a chance to use what they know, the teacher joins them to provide further instruction.

Figure 6.4 Four Possible Learning Events

Type of Learning Event	Unproductive Failure	Unproductive Success	Productive Success	Productive Failure
	Unguided problem solving without further instruction	Rote memorization without conceptual understanding	Guided problem solving using prior knowledge and tasks planned for success	Unsuccessful or suboptimal problem solving using prior knowledge, followed by further instruction
Learning outcome	Frustration that leads to abandoning learning	Completion of the task without understanding its purpose or relevance	Consolidation of learning through scaffolded practice	Learning from errors; learners persist in generating and exploring representations and solutions
Useful for . . .			Surface learning of new knowledge firmly anchored to prior knowledge	Deep learning and transfer of knowledge
Undermines . . .	Agency and motivation	Goal setting and willingness to seek challenge		
Promotes . . .			Skill development and concept attainment	Use of cognitive, metacognitive, and affective strategies

TEACHER ACTIONS

Consider the following actions that reinforce or derail efforts to ensure that students seek feedback and recognize that errors are opportunities to learn. We have included blank lines for you to add your ideas.

Teacher Actions That Reinforce Students' Ability to Seek Feedback and Recognize That Errors Are Opportunities to Learn	Teacher Actions That Derail Students' Ability to Seek Feedback and Recognize That Errors Are Opportunities to Learn
• Modeling seeking feedback and the excitement of using feedback to make improvements	• Assuming that the feedback given was received
• Modeling making mistakes and learning something from the mistakes	• Waiting until the end of the assignment to provide feedback
• Leveraging clear success criteria to support peer-to-peer feedback	• Asking students to give peer-to-peer feedback without clear communication of the success criteria
• Giving students the opportunity to use what they know before stepping in to refine knowledge or further develop skills	• Asking students to memorize information or complete tasks without understanding the relevance

CONCLUSION

In an environment where students are making errors, they need to be drenched in feedback to regain momentum, think strategically, and take action.

Feedback and challenge can play a reciprocal role in fueling the learning of students. The feedback opportunities we create for students should correspond to three avenues: self, peers, and teachers. Consider it this way—in an environment where students are making errors, they need to be drenched in feedback to regain momentum, think strategically, and take action. In places where feedback is nonexistent or unproductive, learners can become paralyzed or even give up. Worst of all, they might rightly come to the conclusion that they're better off playing it safe because errors just make them feel sorry. As we noted in Module 1, challenge ("not too hard, not too boring") is a high-yield approach to learning. The students in Mr. Kearney's class aren't afraid of some challenge, in part because he has created the conditions that make the learning environment optimal for some academic risk taking. In the module that follows, we'll examine practices that he and other teachers like him utilize to ensure that students are equal participants in their own learning.

NOTES