



Introduction

The formative assessment process is a key component of effective classroom instruction as students and teachers work in ongoing cycles of eliciting, interpreting and acting on evidence of student learning. At the heart of the formative assessment process is the use of descriptive and actionable feedback that allows students and teachers to make adjustments in order to close the gap between students' current level of understanding and the intended learning outcomes.

Research shows that feedback is one of the most powerful tools at a teacher's disposal and, when done well, can equate to an effect size equivalent to a 28-percentile gain in student achievement (Igel, Clemons & Apthorp, 2010; p.111). In the *Visible Learning* research, Hattie and Zierer (2019) found feedback to have an effect size ranging from .70 to .79, making it a powerful instructional strategy applicable across all disciplines and grade levels. In spite of the potential impact on learning, feedback is one of the most underutilized instructional practices.

While feedback can be powerful, it can also vary in its impact on learning. According to Hattie and Clarke (2019), **feedback serves many functions including reinforcing success, correcting errors, helping unravel misconceptions, suggesting specific improvements, giving advice for future improvement, praising, or punishing or rewarding.** "Who gives the feedback, whether it is task or ego related and how and whether it is received and acted upon are all factors in its effectiveness" (p. 6). For students to improve academically, they must receive honest, specific feedback that does not harshly judge or evaluate but encourages them to reflect on their work and think critically about how they can do better (Barron & Kinney, 2021). To tap into the power of feedback, teachers must develop an understanding of the key aspects of feedback that have the greatest capacity to positively impact student achievement, whether the feedback is from the teacher to student, student to teacher, student to student or student to self (Hattie & Clarke, 2019).

Impact of Meaningful Feedback on Student Learning

Feedback is a critical aspect of constructing memories, building executive function and "is the glue that holds the acquisition, consolidation and storage of learning together" (Alamrode, Fisher, & Frey, 2022; p. 110). Clear, descriptive feedback also supports students' cognitive development and helps to scaffold their learning. Meaningful feedback provides students with 'just-in-time' information about where they are in relation to the learning goal, helps them recognize which knowledge and skills are strong and which need improvement, and provides

them with specific strategies for next steps. Once students gain a better understanding of where they are in their learning journey and the next steps they need to take to close the gap, research shows they are more likely to take those steps and, as a result, their learning improves (Moss & Brookhart, 2019; Tang & Zahn, 2021; Truckenmiller, Eckert, Coddling & Petscher, 2014).

The quality of feedback students receive shapes their achievement motivation. Meaningful feedback increases students' autonomy and persistence in their work by "giving them the evidence they need to believe that they are, in fact, competent - and where they are not yet competent, giving them the means to become so" (Frey, Hattie, & Fisher, 2018; p. 89). When students have a clear understanding of what to do next, they see improvement as something they can control and are motivated to take those steps (Moss & Brookhart, 2019). Perseverance is impacted as well, as feedback "provides students with additional avenues of support and alternatives to the futile 'wheel-spinning' that effort alone cannot overcome" (p. 89).

Meaningful feedback also supports metacognition, which is a student's awareness of their own thinking and the use of this self-awareness to regulate their thinking. Feedback that supports self-regulation allows students to self-monitor, self-direct and can ultimately improve their performance on difficult tasks (Ruiz-Primo & Brookhart, 2018). Meaningful feedback is a critical element at every stage of the regulation process and provides support to students in (Ruiz-Primo & Brookhart, 2018; Allal, 2011; Vermunt & Verloop, 1999):

- Goal setting/orienting/planning;
- Monitoring progress toward the goal;
- Interpreting results from monitoring to adjust actions; and
- Evaluating whether the learning process has proceeded as expected and the learning goal has been achieved.

Fostering a Feedback Culture

The true power of feedback to impact learning is dependent upon the degree to which the learner views the feedback as meaningful and uses it to take action to improve. Feedback will not impact learning if students do not act on the information (Frontier, 2021; Chappuis, Brookhart, & Chappuis, 2021). So, if the most important aspect of feedback is what students do with it, then teachers must intentionally create the classroom conditions where students are open to receiving feedback (Frey, et al., 2018; Frontier, 2021).

Research consistently shows that one of the most important factors that affects students' perceptions of feedback is the relationship the student has with the teacher. Students need to know that their teacher cares about them, that they are safe, and that they will be treated respectfully by their teacher and peers when asking questions, making their thinking visible, or sharing misconceptions (Hattie & Clarke, 2019; Frey, et al., 2018). When students do not feel

safe, respected or feel they do not belong, they are already at a disadvantage when provided feedback. Their lack of trust leads to little, if any, engagement with the feedback and their motivation to act on it is mainly out of compliance (Hattie & Clarke, 2019; Yeager et al., 2014).

In addition to student-teacher relationships, another key factor that impacts the feedback culture is the view towards making errors, being stuck or having misconceptions. Historically, “being wrong” has been seen as something to be ashamed of or to cover up and erase for fear of the stigma attached with negative perceptions of failure (Hattie & Clarke, 2019). If part of the classroom culture is to always “get things right,” then anything that needs improvement is considered “wrong.” A culture with a negative view of errors can be upsetting, disruptive, and frustrating for students resulting in decreased motivation to engage in the learning process (Hattie and Clarke, 2019; Brookhart, 2017).

Research shows that learning and feedback thrive on errors. **Classroom environments that support meaningful feedback are those in which errors are celebrated and seen as part of the learning process** (Fisher, Frey, & Hattie, 2021; Hattie & Clarke, 2019; Brookhart, 2017). One of the primary purposes for fostering a warm, trustworthy, and compassionate classroom environment is to allow learning to thrive on error. When the classroom environment values errors as part of the learning process, students are more likely to seek out and use feedback to plan and execute next steps for improvement (Brookhart, 2017). Student errors should be highlighted in a positive way, used as opportunities to relearn, and seen as part of the road to mastery. When teachers provide opportunities for students to discuss misconceptions and errors and encourage them to learn from those errors through self-correction, students’ confidence increases, and they are more likely to try a range of strategies when dealing with errors (Hattie & Clarke, 2019).

For more information about the learning environment, please see [EBIP 1: Establishing the Learning Environment](#).

Feedback and the Formative Assessment Process

The purpose of giving and receiving feedback is to close the gap between students’ current level of understanding and the intended learning outcomes. Feedback is provided to students so they know where to go next in their learning and is received by teachers to inform decisions about where to go next in instruction (Almarode, et al., 2022). **Feedback should not be viewed as a one-way transmission model, but as one that operates between teacher and student.** Students’ work, their understandings, questions, misconceptions, and errors are all feedback to the teacher about his/her own performance (Frey, et al, 2018).

Meaningful feedback should help students become more consciously aware of what they are doing, the decisions they make as they are doing it, and the problem-solving strategies and

processes they use to correct, revise or improve their work. (Frey, et al, 2018). Feedback should focus on what students are expected to say and do to demonstrate they have met the learning goals and success criteria and is only meaningful to students when they use it to inform their next steps to improve their learning (Almarode, et al., 2022; Frontier, 2021). In order for teachers to provide meaningful feedback and for students to understand and take action on it, both the teacher and the students must have (Frey, et al., 2018):

- A clear and shared understanding of the learning goals and success criteria;
- The ability to determine present level of performance;
- Strategies and processes that can be put into action; and
- Ways to gauge next steps to move forward.

To increase the likelihood that feedback is received and has an impact on learning, feedback should empower students to answer three critical questions about their learning: (1) “Where am I going?” (2) “Where am I now?” and (3) “Where to next?” (Hattie & Timperley, 2007). Table 6.1 provides a summary of the three feedback questions and their purpose in providing meaningful feedback to students.

Table 6.1 Three Questions for Effective Feedback

Three Questions for Effective Feedback	Purpose
“Where am I going?”	<ul style="list-style-type: none"> • “Feed Up” • Addresses the learning goals and success criteria • Provides a reminder or reframe of the intended learning outcomes
“Where am I now?”	<ul style="list-style-type: none"> • “Feed Back” • Compares students’ current evidence of learning to the intended learning outcomes • Highlights a difference or gap in where students are right now and where they are headed
“Where to next?”	<ul style="list-style-type: none"> • “Feed Forward” • Provides individualized scaffolding or support to all students • Identifies next steps needed to close the gap between current performance and the learning goals and success criteria

Adapted from Almarode, et al., 2018; Fisher, et al., 2021; Hattie & Timperley, 2007

The formative assessment process is a continuous cycle in which teachers establish learning expectations, design lessons and tasks to elicit evidence of student understanding, identify gaps in students' knowledge and performance, monitor progress towards the goals, provide feedback, and then take action based on the results. Feedback is an important component of the formative assessment process and should be a part of ongoing teaching and learning. Students' responses, insights and behaviors are all feedback to the teacher and used to guide next steps in learning. **Formative feedback is most effective when combined with other key formative assessment practices including clarifying and sharing clear learning goals and success criteria and eliciting evidence of student thinking through lessons, assignments and tasks aligned to those goals** (Brookhart, 2017).

Clear Learning Goals

Clarifying and sharing clear learning goals and success criteria is a fundamental requirement for both feedback and learning. Learning goals and success criteria show students where to focus their time and effort and provide specific reference points for feedback. Success criteria help focus feedback on the most important features in students' work that are essential to reaching the learning goal, as well as provide the means for measuring progress along the way (Ruiz-Primo & Brookhart, 2018).

When students are not clear about what they are supposed to learn and how success will be measured, they often complete tasks and assignments merely out of compliance. They tend to spend their time trying to figure out or guess what the teacher wants them to do rather than engaging with the task and its intended learning (Hattie & Clarke, 2019). In this case, students tend to view any feedback given simply as more teacher directions. However, when students are actively engaged in the learning process and receive feedback aligned to the learning goals and success criteria, students are more equipped to respond to the three feedback questions to improve their learning: "Where am I going?" "Where am I now?" and "Where to next?" (Ruiz-Primo & Brookhart, 2018).

For more information about clear learning goals, please see [EBIP 2: Clarifying and Sharing Clear Learning Goals](#).

High-Quality Tasks

In addition to clarifying and sharing clear learning goals and success criteria, teachers must ensure the work students are asked to do embodies those goals and is formatively assessed throughout the learning process using the success criteria. High-quality assignments and tasks aligned to clear criteria make meaningful feedback possible whether the "task" is responding to a question or prompt, participating in a class discussion, creating a model, writing an essay, or solving a problem (Ruiz-Primo & Brookhart, 2018). "Getting underneath student understanding, finding out what they really think, is the starting point for all feedback, from whichever

direction, because only then can the feedback be appropriately constructed to provide advice” (Hattie & Clarke, 2019; p. 4).

When assignments and tasks are of poor quality and/or do not match the intended learning outcomes in both content and cognitive level, the lesson will not provide appropriate evidence of student thinking and cannot be used to measure progress towards the goal. When teachers intentionally plan and utilize tasks, assignments and other opportunities to respond that align with the learning goals and success criteria, the resulting evidence of student understanding paves the way for meaningful feedback for both students and teachers (Almarode & Vandas, 2018; Ruiz-Primo & Brookhart, 2018). One useful resource that can support teachers in designing or selecting high-quality tasks aligned to the *Kentucky Academic Standards* is the [Assignment Review Protocols](#).

As a part of designing or selecting high-quality tasks that make student thinking visible, teachers need to anticipate likely student responses in order to proactively plan for different types of potential feedback that can improve student learning. Ruiz-Primo and Brookhart (2018) recommend that teachers never give a task or assignment to students that the teacher has not completed beforehand. Completing the task ahead of time allows the teacher to anticipate potential errors students may make and to prepare questions and instructional moves in advance that help students focus on the critical aspects of the task when they complete it. “This helps teachers to develop an interpretative state of mind and to be prepared to provide more appropriate, robust, meaningful feedback, either orally or using instructional moves” (Ruiz-Primo & Brookhart, 2018; p. 91).

Feedback vs Grades

According to Brookhart (2017), feedback is “just-in-time, just-for-me information delivered when and where it can do the most good” (p. 1). Information provided to students at the end of a unit, project, task, or assignment is evaluation, not feedback. **Meaningful feedback allows students the opportunity to take action and use the information to improve learning during the learning process.** When given at the end of the task, the information is neither actionable since the task is finished, nor useful because there is little to no opportunity to apply it (Fisher, et al., 2018).

When students are given a grade along with comments/suggestions, students tend to focus more on the grade and ignore the comments, because a grade typically signifies, “You’re done” (Chappuis, et al., 2021; Nottingham & Nottingham, 2017). Students see no point in revising their work based on the comments because the window for learning has closed. Often, “students will look at their grades first and, if it is a good grade, think to themselves, ‘Why do I need to improve?’ And if they got a bad grade, then they think, ‘Why try to improve? I’m no good at this anyway’” (Nottingham & Nottingham, 2017; p. 16).

At the heart of formative assessment and feedback is providing students opportunity to respond during learning when there is still time to take action and improve. **Teachers should deliberately plan lessons that include opportunities for students to use feedback which helps to cultivate a growth-oriented mindset and encourage students to view mistakes as a natural part of the learning process** (Chappuis, et al., 2021). Hattie and Clarke (2019) recommend teachers utilize ongoing and mid-lesson stops that direct students' attention back to the learning goal and success criteria, as well as the models and examples of what success looks like to help them self-assess where they are and determine their next steps. These strategic pauses can help students focus their time and effort, improve their ability to self-regulate and increase their motivation to engage in the learning process.

When teachers provide meaningful feedback that is likely to inform and motivate students and when they determine instructional next steps based on students' current understanding, all parts of the formative assessment process benefit. Students gain a better understanding of the learning goals and success criteria, acquire information that can be used for improvement and are more likely to take next steps in learning (Ruiz-Primo & Brookhart, 2018).

Providing Meaningful Feedback

Research shows that feedback has the potential to influence student outcomes positively or negatively. Some types of feedback are less effective than others and not all feedback is useful (Nottingham & Nottingham, 2021). "The type of feedback teachers provide, however well meaning, can in fact inhibit learning, so it is crucial to understand how to best leverage this powerful tool" (Frey, et al, 2018; p. 78). The power of feedback lies in its potential to move learning forward and must be structured in a way that helps students progress from surface learning to deep learning and enables them to transfer that learning to new problems or situations (Almarode & Vandas, 2018).

Feedback in the form of praise or rewards is one of the least effective types since it does not contain real information about student learning and should not be regarded as actual feedback. Feedback that is vague and/or general will not build student agency and help close the gap between students' current level of understanding and the intended learning outcomes (Fisher, et al., 2021). **For feedback to improve learning, the content of the feedback must focus on reducing the gap between a student's current understanding or performance and what is expected and seek to improve students' learning strategies that enable them to self-regulate their own learning.** Feedback "should contain information that is under the students' control (e.g., effort, ways to monitor or check work, strategies to set up a work plan), in contrast to evaluating an individual's ability or personality" (Ruiz-Primo & Brookhart, 2018; p. 16).

Characteristics of Meaningful Feedback

While there is no one formula for providing meaningful feedback, research does point to several characteristics that can maximize the chances that students will receive and take action on the feedback and improve their learning. Figure 6.2 summarizes three characteristics of meaningful feedback (Fisher, et al., 2018; Chappuis, et al., 2021; Almarode and Vandas, 2018).

Table 6.2 Characteristics of Meaningful Feedback

Characteristic	Description
Timely	<ul style="list-style-type: none">• Occurs during the learning process, when there is still time for students to act on the feedback• Given while students are still mindful of the learning goals and success criteria and still working towards mastery of those goals
Specific	<ul style="list-style-type: none">• Highlights specific strengths as well as area(s) of improvement• Identifies what was done correctly, describes a feature of quality present in the work, and/or highlights effective use of a strategy or process• Focuses on a narrow range of the most important portions of student work related to the most relevant success criteria• Highlights the area(s) of focus for continued learning by identifying a mistake, describing a feature of quality needing work, or a problem with a strategy or process
Actionable	<ul style="list-style-type: none">• Limited to the appropriate amount of advice students are able to act on in a given time• Directs students toward specific steps they can take to close the gap between where they are and the intended learning outcomes• Developmentally and cognitively appropriate• Offers just enough guidance that the student is pointed in the right direction while not taking the thinking and cognitive challenge away from the student• Offers a reminder, asks a question, and/or makes a specific suggestion for action to take

Students must understand the feedback for it to be useful and for them to take action on it.

“When students are lost in understanding the content of the feedback, they are not likely to know what to do with it; it may even cause them to feel as though they have failed twice. ‘I don’t know how to do this, and I don’t understand what my teacher’s telling me to do about it’ (Chappuis, et al, 2021; p. 98-99). Teachers should always check to determine if students

understand and can interpret the feedback provided. Possible questions teachers can ask to check for understanding include (Hattie & Clarke, 2019).

- “What did you understand from what I just said?”
- “How might you use this feedback in your next learning step?”
- “What else might you need from me right now to help in your learning?”

For feedback to be meaningful, students’ work needs to demonstrate at least partial understanding of the learning goal and success criteria. Chappuis, et al., (2021) cautions that feedback is not always the best choice for an instructional intervention. **If a student’s work does not demonstrate even partial mastery and there is little to nothing of substance to use as the basis for success comments, attempting to teach through feedback is generally ineffective. At this point, offering further instruction and re-teaching is the best option.**

Levels of Feedback

One of the main reasons feedback can vary greatly in its ability to improve student learning is that feedback must be aligned with where the students are in the learning cycle. When misalignment occurs, then the feedback is likely to be misinterpreted, misheard, or ignored (Hattie & Clarke, 2019). According to research, corrective feedback paired with information about processes and self-regulation has the greatest potential to improve student learning (Wisniewski, B., Zierer, K., & Hattie, J., 2020). Students benefit most from feedback that helps them to not only understand what mistakes they made, but also why they made those mistakes and what they can do to avoid them next time.

Research has identified three types of feedback that support and improve student learning: **task, process** and **self-regulation** (Hattie & Timperley, 2007). “The timing in the use of each type of feedback is dependent on the learning goals, success criteria, and current level of performance of the student” (Almarode & Vandas, 2018; p. 136). Figure 6.3 provides a summary of each feedback level, along with examples of teacher/student prompts to support each type.

Table 6.3 Levels of Feedback

Level	Description	Teacher/Student Prompts
Task Feedback	<ul style="list-style-type: none"> • Also known as corrective feedback • Provides students with information about the accuracy and completeness of a task • Supports the acquisition, storing, reproduction and use of knowledge 	<ul style="list-style-type: none"> • How well has the task been performed? Is it correct or incorrect? • Does the answer meet the success criteria?

Level	Description	Teacher/Student Prompts
	<ul style="list-style-type: none"> Supported by teacher modeling, use of examples and non-examples, as well as clear explanations of procedural steps, key features and context Most useful when students are engaged in surface learning of new content to develop students' understanding of the content, ideas and terms 	<p>How can the student elaborate on the answer?</p> <ul style="list-style-type: none"> What did the student do well? Where did the student go wrong? What is the correct answer? What other information is needed to meet the criteria?
Process Feedback	<ul style="list-style-type: none"> Provides feedback to students on their thinking and the processes and/or strategies used to complete a task Supports students in making connections and use of multiple strategies for error detection Focuses on relationships between ideas and students' strategies for evaluating the reasonableness of an answer or solution Provides cues about different strategies for approaching a problem or task More effective than task-level feedback for deepening learning and creating understanding Most useful when students develop proficiency of the specific content, ideas and terms 	<ul style="list-style-type: none"> What are the strategies needed to perform the task? Are there alternative strategies that can be used? What is wrong and why? What strategies did the student use? What is the explanation for the correct answer? What other questions can the student ask about the task? What are the relationships with other parts of the task? What other resources are provided that can help the student? What is the student's understanding of the concepts/knowledge related to the task?
Self-Regulation Feedback	<ul style="list-style-type: none"> Focuses attention on the students' use of self-regulatory skills and promotes metacognition through self-verbalization, self-questioning and self-reflection 	<ul style="list-style-type: none"> How can I monitor my own work? How can I reflect on my own learning?

Level	Description	Teacher/Student Prompts
	<ul style="list-style-type: none"> • Fosters students’ ability to know what to do when they approach a new and different problem, are stuck or have to apply their understanding in a new way • Enhances self-evaluation skills, generates greater confidence to engage further in the task and helps students decide what to do for the best outcome • Appropriate for students who have reached a deep level of conceptual understanding and are armed with multiple strategies as they transfer their learning to more rigorous tasks 	<ul style="list-style-type: none"> • What further doubts do I have regarding this task? • How does this compare with ...? • What does all this information have in common? • What learning goals and/or success criteria have I achieved? • How have my ideas changed? • Can I now teach someone else how to ...?

Adapted from Almarode & Vandas, 2018; Hattie & Clarke, 2019; Hattie, 2012)

Most of the feedback teachers provide to students is typically in the form of task feedback. Students tend to welcome this type because it is easier to apply than process or self-regulation feedback, which requires deeper, more conceptual thinking. However, teachers need to be careful they do not stay with task feedback, as doing so reinforces to students that this is the prime purpose of the lesson (Fisher, et al., 2021). As students demonstrate understanding of the content, ideas and terms, then the feedback increasingly shifts to process feedback. “Like task feedback, process feedback should be specific and constructive and should support learners’ pathways toward self-regulation feedback. That is, it should deepen thinking, reasoning, explanations, and connections” (Almarode & Vandas, 2018; p. 138). When students have misconceptions or a gap arises in foundation or background learning, they benefit from both task and process feedback.

Students who have reached a deep level of conceptual understanding and are equipped with multiple strategies benefit from self-regulation feedback as they transfer their learning to more rigorous tasks. At this point, students see themselves as their own teachers with clear knowledge about where they are in their own learning process, how they are progressing to or beyond the learning goal and success criteria, and they can monitor their own progress. Even at this stage students need scaffolding as they progress toward this metacognitive awareness, and this can be supported by teaching students the art of self-questioning. Teachers can model this through the questions they pose to students as students move from processing to and through

self-regulation (Almarode & Vandas, 2018). As students shift from mastery of current learning goals to new learning goals in a given instructional unit, they will often require more task and process feedback initially until they once again transition from surface level learning to deeper levels of content understanding.

Peer-and-Self Feedback

Peer-and-self assessment plays a critical role in a strong formative feedback culture and helps students improve their self-regulation skills and their sense of self-efficacy. As they learn to become more self-regulatory, students are able to monitor, direct and regulate their own actions as they progress toward the learning goals. Both peer-and self-assessment are key components in the formative feedback loop and require students to understand and use the success criteria (Moss & Brookhart, 2019).

A review of the research on both self-and-peer assessment shows that a classroom culture characterized by strong teacher and peer relationships and a sense of psychological safety and trust are key factors in the success of these strategies (Andrade & Brown, 2016; Panadero, 2016 in Moss & Brookhart, 2019; p. 70). Teachers must take the time to intentionally “attend to the classroom learning culture before and during use of either of these strategies. Otherwise, these strategies may fail, and they may undermine students’ feelings of safety” (Moss & Brookhart, 2019; p. 70).

Peer Feedback

Peer assessment involves students applying the success criteria to another student’s work in order to provide formative feedback the peer may use for improvement. In terms of the formative assessment process, **peer assessment is best viewed as a collaborative learning activity focused on increasing students’ clarity of the learning goals and the success criteria** (Panadero, 2016; Strijbos, 2016; Moss & Brookhart, 2019; Philippakos & MacArthur, 2016). Providing students the opportunity to examine and comment on one another’s work results in the following benefits (Chappuis, et al., 2021; p. 102-103):

- It deepens understanding of quality for the student who is providing the feedback.
- It allows for students to receive comments on their work in a relatively short period of time, thereby increasing feedback opportunities for all.
- Some students are more apt to be open to feedback from a peer, which may be seen as less evaluative than that from a teacher.
- Students can often come up with suggestions for next steps because they are encountering the same issues.
- After giving someone else feedback, students are better able to view their own work through another’s eyes, spurring new thoughts and insights useful in revising their own work.

Teachers can model feedback for students by using samples of student work, reviewing the learning goal and success criteria with the whole class, and analyzing the work in light of the criteria and discussing what feedback to provide and why. **Teachers should also provide opportunities for students to practice giving feedback in a controlled environment.** A possible way teachers might structure this practice is outlined below (Chappuis, et al., 2021; p. 103):

- The teacher selects an anonymous sample of student work exhibiting both strengths and areas needing improvement.
- Students work in pairs, with one assuming the role of “student” and the other that of “teacher.” Each separately examines the sample and uses the success criteria to identify strengths and areas of need.
- Student pairs then meet in a simulated three-minute feedback conference. The “student” shares their thoughts first, and the “teacher” follows up with anything the “student” might have overlooked or with which the “teacher” disagrees. While the “teacher” talks, the “student” takes notes.
- At the end of the three minutes, the classroom teacher conducts a group debrief of the simulation, asking students what was easy and what was difficult about offering or receiving feedback. The class brainstorms solutions to potential problems.
- The students switch roles and engage in another round of the simulation with a different anonymous example.

The best time for peer feedback is after students have developed proficient understanding of the content, concepts and skills and are ready to examine connections and relationships among those concepts and ideas. If students are still in the surface level stage of learning, it is often more effective to re-teach concepts than to engage in peer feedback. Engaging in peer feedback too early in the learning process may result in students reinforcing wrong ideas and concepts. “But when asking students to play with ideas, explore relations between ideas and extend their thinking, peer feedback can be most powerful” (Hattie & Clarke, 2019; p. 97).

When students practice applying the criteria for good work through peer assessment, it helps to build general knowledge about the learning goal more than individuals’ skills at meeting it. “Because peer assessment may not be the most direct path to improving students’ own learning, it should be used when the purpose of a lesson is to provide external feedback to classmates about some work they will have an opportunity to revise” (Brookhart, 2017; p. 84). Following peer feedback, teachers should build in time for students to apply the peer feedback and their understanding of the learning goals and success criteria as they review their own work.

Self-Feedback

Research consistently shows that achievement improves when students are required to think about their own learning, articulate what they understand and can do well, and determine

what they still need to learn (Black & Wiliam, 1998; Hattie, 2009; Chappuis, et al., 2021). **Self-assessment (and self-feedback) should be viewed as both an instructional and an assessment strategy allowing students to evaluate their own work against the learning goals and success criteria and adjust learning strategies as needed.** “Self-assessment increases students’ interest in feedback because the feedback is ‘theirs’; it answers their own questions and helps them to develop the self-regulation skills necessary for using any feedback” (Brookhart, 2017; p. 80).

Self-assessment is grounded in students’ response to the three primary feedback questions beginning with, “Where am I going?”, then reviewing their own work or their thinking to determine, “Where am I now?” and finally answering, “Where to next?” Teachers need to intentionally model and teach self-assessment skills by helping students learn how to apply criteria to their own work, connect their success at doing so with their further learning and see that applying the success criteria helps them participate in the formative learning cycle. (Moss & Brookhart, 2019). The following strategies can help maximize the effectiveness of self-assessment (Andrade and Valtcheva, 2009; Moss & Brookhart, 2019; Ruiz-Primo & Brookhart, 2018):

- Clearly define the success criteria for the work students are going to assess.
- Design tools (e.g., templates, checklists or sets of reflective questions) that help students use the criteria.
- Teach students how to apply the criteria to examples of work and provide them opportunities to practice.
- Give students feedback about the quality of their feedback.
- Help students learn to use their feedback to improve.
- Provide sufficient time for students to use the feedback they generate.
- Use self-assessment formatively, not as a part of grading.

Self-assessment should occur regularly throughout the learning process to help build students’ confidence, allow them to make plans for improvement and reinforce their awareness of these skills (Fisher, et al., 2021). “The more proficient a learner is at accurately assessing his or her own work, the more likely that student is able to prioritize and strategize next efforts to learn. Additionally, students who can self-assess are more responsive to feedback because they understand how feedback works” (Frontier, 2021; pg. 116).

Students also need opportunities to set goals as a result of their self-assessments, which moves students from “Where am I now” to “Where to next?” and “How can I get there from here?” When students successfully set, pursue and accomplish their own goals, it increases their confidence, independence and self-efficacy. When creating a goal, students should begin with a clear statement of the intended learning outcomes and a description of their current status in relation to those outcomes. Students then create an action plan that specifies (Chappuis, et al., 2021):

- Steps they will take to achieve the goal;
- When and where they will do the work;
- Who they will work with; and
- Materials they will need to support them along the way.

As part of an effective feedback culture, both self-assessment (internal feedback) and teacher and peer feedback (external feedback) provide students the means to control their learning. As students encounter new concepts and skills, more teacher feedback is required that describes students' performance and offers strategies for improvement. The strategies teachers suggest and model early in the learning process become part of the students' repertoire for practicing that skill and understanding the content. Students begin to internalize the success criteria included in the teacher feedback as they review their own work (Brookhart, 2017). Over time, less teacher feedback is needed and students engage in more and more self-assessment as they deepen their conceptual understanding of the content and can identify their own learning strategies to continue progressing toward the goals.

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