

## Characteristics of Effective Instruction

# Assessment for Learning (Formative Assessment)

### Purpose

The purpose of this brief is to provide Iowa educators with a clearer understanding of what is meant by assessment for learning (formative assessment) as a characteristic of effective instruction within the Iowa Core.

### Definition

Formative assessment is a process used by teachers and students as part of instruction. It provides feedback to adjust ongoing teaching and learning to improve students' achievement of core content (Adapted from Council of Chief State School Officers, 2010).

Assessment for learning is a characteristic of effective instruction and is an essential component of the Iowa Core. As defined, it is a process, not an assessment tool or instrument. The process includes collecting information on student progress toward a learning goal and using the information to adjust instruction and increase student learning. The assessment for learning process is not an add-on to instruction, but an integral part of instruction necessary to identify and close the learning gap for each student.

There are numerous formal or informal strategies teachers and students may use during instruction to monitor progress toward a specific learning goal. These strategies are a planned part of instruction and may include observations, embedded questions, probes, ungraded quizzes, scoring guides, or other checks for understanding. These strategies alone are not assessment for learning, but become so when the information gained is used to adjust learning or instruction. As W. James Popham (2008) states in *Transformative Assessment*, "It is not the nature of the test that earns the label of formative or summative, but the use to which the test's results will be put."

Another key aspect of the definition is that assessment for learning is used by both teachers and students. Teachers use feedback to check for student understanding during the instructional process and to make adjustments to their instruction as necessary. Students use feedback from the process to monitor their own learning and to make adjustments in their learning tactics. This process occurs during instruction while learning is ongoing.

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*An assessment activity can promote learning if it*

- *provides information that teachers and their students can use as feedback in assessing themselves and one another, and*
- *modifies the teaching and learning activities in which they are engaged*

*Such assessment becomes "formative assessment" when the evidence is actually used to adapt the teaching work to meet learning needs. (Black, Harrison, Marshall, & Wiliam, 2003)*

It is also important to note, that although all assessment for learning is classroom assessment, not all classroom assessment is—or should be—assessment for learning. There is a time and a place for classroom summative assessments as well. Information from each assessment type is used differently and must be used for its intended purpose only.

## Critical Attributes of Assessment for Learning

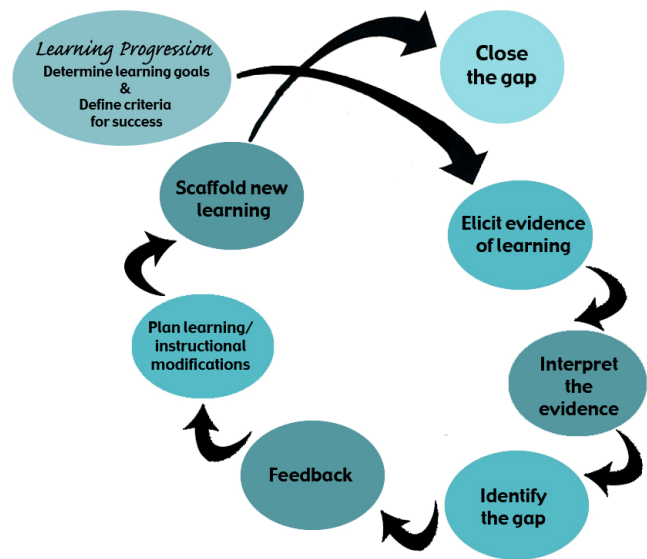
Critical attributes of the assessment for learning process include an understanding of the learning progression, clear learning goals, instructional modifications based on elicited evidence of learning, descriptive feedback, self- and peer-assessment, and a collaborative classroom climate.

## Learning Progressions

***Educators utilize K–12 learning progressions along which students are expected to progress in a domain.***

The classroom teacher needs a deep understanding of the learning goal in order to remain focused on the big ideas surrounding that learning goal and be able to map future learning opportunities. The teacher also needs to know the prerequisite concepts and skills students need to develop deep conceptual or procedural knowledge of the learning goal. Understanding this learning progression a student might take allows the teacher to adequately plan pre-assessment, plan assessment for learning activities, identify a student’s zone of proximal development, and provide differentiation tasks for individual students. “As teachers use assessment and learning dynamically, they increase their capacity to derive deeper understanding of their students’ responses; this then serves to structure increased learning opportunities” (Darling-Hammond, Aness, & Falk, 1995, p. 131).

**Figure 1: Formative Assessment Model**



(Heritage, 2009a, 2009b, 2010).

*The learning progression describes a conceptual or procedural sequence along which students can move incrementally from novice to more expert performance. Implicit in progression is the notion of continuity and coherence. “Learning is not viewed as a series of discrete events, but rather as a trajectory of development that connects knowledge, concepts and skills within a domain” (Heritage, 2007).*

## Clear Learning Goals and Success Criteria

***Student learning goals are clear, focused on the intended learning, and communicated so all students understand the criteria for success.***

Both the student and the teacher need to remain focused on clear learning goals. Keeping these in “kid- friendly” language and providing students with examples of both high and low quality work ensures that students know what learning is expected of them. As part of the assessment for learning process, teachers articulate the learning goal to students and provide students with the criteria for which their success will be judged. Knowing what the learning goal is, having clear success criteria identified, and remaining focused on them are strong motivators for students.

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*A learning goal differs from a learning objective. While the objective describes what the student will do and the conditions under which the student will perform the task, the learning goal states the intended learning that is to be attained. Usually the goal begins with “understands that...” and the success criteria begin with “I can...”*

## Instructional Modifications Based on Evidence

***Instructional modifications for students are planned from carefully elicited evidence of student learning.***

The teacher includes the collection of on-going evidence of student learning with regard to the intended learning goal in the instructional plan strategies. Upon interpreting the evidence, the teacher identifies student learning gaps relative to the learning goal. The teacher provides descriptive feedback to students and plans instructional modifications based on the students’ zone of proximal development.

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*The learning gap differs from an achievement gap. The learning gap naturally exists for all students. It is the difference between what a student currently knows and what he/she needs to know next. As we close one learning gap a new one emerges.*

## Descriptive Feedback

***Descriptive feedback identifies the specific knowledge and skills needed to reach learning goal (s) for students.***

Descriptive feedback is provided to the student in a timely manner. It needs to provide the student with information about what was done well, what still needs improving, and suggestions regarding how to improve. Teachers must also provide the student with opportunities to make the corrections. The feedback may be provided orally or through written communication. It may be also provided by the teacher, another adult, or by a peer; but it is critical that feedback is focused on what a student might do to build on current knowledge.

## Self- and Peer-Assessment

***Self- and peer-assessment is planned and structured by educator and students in order to develop life-long learning skills.***

In order for students to become autonomous learners and take responsibility for their own learning, they need to be encouraged to use self- and peer-assessment. Dunning, Heath, and Suls (2004) observe that “accurate self-assessment is crucial for education to be a lifelong enterprise that continues far after the student has left the classroom” (p. 85).

This is not about students grading their own or peers’ work, but about providing and receiving feedback to help improve their work. “Peer-assessment [and self-assessment] is interpreted as a learning activity, instead of merely a scoring or ranking tool” (Sluijsmans, 2002). It also helps students learn which learning tactic does or does not work in a given situation for them personally. If our goal is for students to become autonomous learners, then they need the opportunity to think about their learning and assess their efforts.

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“... ‘Metacognition’- [is] the ability to monitor one’s current level of understanding and decide when it is not adequate” (Bransford, Brown, & Cocking, 2000, p. 47).

These practices require skills in metacognition which need to be taught and modeled by the teacher. For it to be effective, students need to have a clear understanding of the learning intention for the self- or peer-assessment and know what they are specifically looking for in the work. This is not something that is accomplished without planning and is a structured process. Teachers need to help students learn to self- and peer-assess work.

## Collaborative Classroom Climate

***A collaborative classroom climate is conducive to assessment for learning.***

For assessment for learning to work, the classroom atmosphere must be one in which the student feels respected and the teacher’s role is one as a collaborator. The classroom culture should exemplify a non-threatening culture distinguished by a sense of trust between teachers and students, respect, appreciation of differences, and transparency in the learning objectives. Ideally, all members of the class understand that learning is a collaborative partnership and they work together to see that all continuously learn.

While evidence from research indicates that all six attributes of assessment for learning will lead to increased student learning, there is no indication as to which is the most important attribute. As teachers build in their capacity to use the process of formative assessment, all attributes will become a part of their classroom practice.

## Evidence Base

As you review the following research, keep in mind that the formative assessment described by each researcher is defining formative assessment as the Iowa Department of Education is defining assessment for learning.

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*A meta-analysis combines the results from several studies with related research hypotheses.*

In 1998(b), Paul Black and Dylan Wiliam reported on their meta-analysis based on nine years worth of research through over 250 articles in over 160 journals. They found that “The consistent feature across the variety of these examples is that they show that attention to formative assessment can lead to significant learning gains.” When comparing the average improvements in test scores of students involved in formative assessment practices to the average improvements in test scores of students in classrooms not involved in formative assessment practices, they discovered typical effect sizes of from 0.4 to 0.7. These effect sizes are larger than most of those found for educational interventions or initiatives.

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*Effect size is a statistical analysis used in meta-analyses to compare the results between two or more studies. An effect size of .4 represents change from the 16<sup>th</sup> percentile to the 32<sup>nd</sup> percentile. An effect size of .7 would result in change from the 35<sup>th</sup> percentile to the 61<sup>st</sup> percentile on a criterion-referenced standardized test.*

Black and Wiliam (1998a) also found that “...irrespectively of the particular approach adopted, we have not come across any reports of negative effects following an enhancement of formative assessment practices.” Usually new initiatives/strategies will result in a dip in student learning as the teacher learns to hone the strategy or instructional practice and as the students become accustomed to it. Then after a period of time the increases in student learning occur. What Black and Wiliam found was that no dip in student learning occurs as teachers begin to implement formative assessment practices.

As part of the same study, Black and Wiliam found that learning gains were greater for low achieving students than for all other students— reducing the achievement gap. It is important to note they found learning gains reported for all students in classrooms engaged in formative assessment practices.

Another strong finding of the research being conducted on formative assessment practices is related to the frequency of its use by classroom teachers. In 1991, Robert Bangert-Drowns, James Kulik, and Chen-Lin Kulik analyzed findings from 29 studies on the frequency of assessments. They found that even a single formative assessment practice used in a 15-week unit of study resulted in an effect size gain of 0.34 and the more frequently the practices are used the greater the effect size.

Fuchs and Fuchs (1986) discovered a similar gain in effect size with multiple uses of formative assessment practices. They found that if a teacher provided two formative assessment practices per week in the form of curriculum-based data collection, they resulted in an effect size of 0.85, or a percentile gain of 30 points on a standardized test.

John A. Ross, Gary Hogaboam, and C. Rolheiser (2002) examined the effects of training 5<sup>th</sup> and 6<sup>th</sup> grade students to self-assess and compared it to student achievement in mathematics problem solving. They found—in a study of over 500 students—that those students who practiced self assessment strategies as a part of formative assessment practices in the classroom outperformed students who did not use self-assessment strategies (effect size of 0.40).

In a study comparing achievement gains in classrooms using four different types of teacher feedback, the greatest pre-and post-test achievement gains were obtained by students who received comments from teachers compared to those who received numerical grades, praise, or no feedback (Butler, 1988).

There is strong research evidence that suggests that assessment for learning has positive effects on student learning. As part of the instructional process, it is an integral part of effective instructional models that facilitate learning, such as problem-based learning, inquiry-based learning, project-based learning, inductive thinking, direct instruction, and others.

The following section shows how assessment for learning relates to the three connecting elements of the Iowa Core regarding planning, instructing, and assessment.

## Planning

### ***Assessment for learning is a planned process.***

Effective assessment for learning begins with the teacher understanding the intended learning to conceptualize the sequence along which students can move incrementally from novice to more expert performance—either a formally or informally developed learning progression. Then the teacher can identify the learning goal to plan success criteria, pre-assessments, instruction, differentiation tasks, assessment for learning strategies, and summative assessments. For each student, the teacher uses the information gained from the assessment for learning practice to determine the zone of proximal development and to plan differentiation tasks.

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*The zone of proximal development (ZPD) is the difference between what a learner can do without help and what the learner can do with guidance. It is the range within which the learner is in position to experience new learning. (Vygotsky, 1978)*



## Instructing

***Assessment for learning is part of the instructional process, not an addition to the process.***

Assessment for learning takes place **during** instruction.

The practice includes the following:

- Providing students with clear learning goals and success criteria
- When appropriate, providing models of both high and low quality work
- Providing instructional modifications for students from carefully elicited evidence of student learning
- Providing descriptive feedback to help the student know what was done correctly and what could be done to improve
- Provide scaffolded learning based on identified learning gaps
- Allowing for self- and peer-assessment, for students to think meta-cognitively, and to develop understanding of effective learning tactics
- Creating a classroom climate of collaboration— a partnership in the learning process.

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*For Iowa teachers, learning progressions and learning goals may be identified through both vertical and horizontal articulation of the essential concepts and skills in the Iowa Core.*

## Assessment and Evaluation

***Assessment for learning practices provide assessment-based feedback to both teachers and students.***

If teachers are to build on students' knowledge and previous learning, they must first be able to identify that previous learning. This does not necessarily imply the use of formalized assessment for learning tools, such as pre-assessment tests, probes, or other written documents. Prior knowledge may be elicited through informal assessment for learning tools such as observations, class discussions, checklists, participation counts, rubrics, or self-assessments. "Teachers' skills in drawing inferences from students' responses are crucial to the effectiveness of formative assessment" (Heritage, 2007, p. 144).

The information learned from data collected from assessments for learning tools are used by both teachers and students. The information helps teachers and students make adjustments that will improve student learning. Students use the information to monitor progress toward the learning goal and to adjust learning tactics. Teachers use the information to adjust instruction and meet the needs of all learners. Assuredly, "a critical component of quality formative assessment is teachers' use of the evidence obtained from students' performance on assessment tasks to adjust instruction and to guide students in adjusting their learning strategies" (DeMeester & Jones, 2009, p. 7).

## Sources

- Bangert-Drowns, R., Kulik, C., & Kulik, J. (1991). Effects of classroom testing. *Journal of Educational Research, 85*(2), 89–99.
- Black, P., Harrison, C., Marshall, B., & Wiliam D. (2003). *Assessment for learning: Putting it into practice*. Berkshire, England: Open University Press.
- Black, P., & Wiliam, D. (1998a). Assessment and classroom learning. *Assessment in Education: Principles, Policy, & Practice, 5*, 7–74.
- Black, P., & Wiliam, D. (1998b). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan, 80*, 139–148.
- Black, P., & Wiliam, D. (2004). Working inside the black box. *Phi Delta Kappan, 86*(1), 8–21.
- Bransford, J. D., Brown, A. L., & Cocking, R. R., Committee on Developments in the Science of Learning, National Research Council. (2000). *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academies Press.
- Brookhart, S. (2005, April). *Research on formative classroom assessment*. Paper presented at the annual meeting of the American Educational Research Association, Montreal.
- Butler, R. (1988). Enhancing and undermining intrinsic motivation: The effects of task-involving and ego-involving evaluation of interest and performance. Leicester, UK: *British Journal of Educational Psychology, 58*(1), 1–14.
- Cauley, K., Pannozzo G., Abrams, L., McMillan, J., & Camou-Linkroum, S. (2006). *The relationship between classroom assessment practices and student motivation and engagement: A literature review*. Metropolitan Educational Research Consortium (MERC).
- Darling-Hammond, L., Ancess, J., & Falk, B. (1995). *Authentic assessment in action*. New York: Teachers College Press.
- DeMeester, K., & Jones, F. (2009). *Formative assessment for PK–3 mathematics: A review of the literature*. Retrieved from <http://lsi.fsu.edu/Uploads/1/docs/Formative%20Assessment%20Lit%20Review%20FCR-STEM.pdf>
- Dunning, D., Heath, C., & Suls, J. (2004). Flawed self-assessment: Implications for health, education, and the workplace. *Psychological Science in the Public Interest, 5*(3), 69–106.
- Council of Chief State School Officers. (2010). *Formative Assessment for Students and Teachers (FAST)*. Retrieved from [http://www.ccsso.org/Resources/Programs/Formative\\_Assessment\\_for\\_Students\\_and\\_Teachers\\_\(FAST\).html](http://www.ccsso.org/Resources/Programs/Formative_Assessment_for_Students_and_Teachers_(FAST).html)
- Fuchs, L., & Fuchs, D. (1986). Effects of systematic formative evaluation: A meta-analysis. *Exceptional Children, 53*, 199–208.
- Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan, 89*(2), 140–145.
- Heritage, M. (2009a). *The process of formative assessment*. Presentation at the meeting of Iowa Assessment for Learning Institute, Des Moines, IA.



- Heritage, M. (2009b). *Understanding formative assessment and utilizing it to improve Classroom instruction*. Presentation at REL Midwest at Learning Point Associates' Lessons Learned about Formative Assessment Use, Chicago, IL.
- Heritage, M. (2010). *Formative assessment: Making it happen in the classroom*. Thousand Oaks, CA: Corwin Press.
- Popham, W. J. (2008). *Transformative Assessment Alexandria*. VA: Association for Supervision and Curriculum Development.
- Ross, J., Hogaboam-Gray, A., & Rolheiser, C. (2002). Student self-evaluation in grade 5–6 mathematics: Effects on problem solving achievement. *Educational Assessment*, 8(1), 43–58.
- Shepard, L. (2000). The role of assessment in a learning culture. *Education Researcher*, 29(7), 4–14.
- Sluijsmans, D. (2002). Establishing learning effects with integrated peer assessment tasks. *The Higher Education Academy*. Retrieved from <http://www.palatine.ac.uk/files/930.pdf>
- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.