FORMATIVE ASSESSMENT: EXAMPLES OF PRACTICE

A WORK PRODUCT INITIATED AND LED BY
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Paper prepared for the Formative Assessment for Teachers and Students (FAST) State Collaborative on Assessment and Student Standards (SCASS) of the Council of Chief State School Officers (CCSSO)

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THE CCSSO FORMATIVE ASSESSMENT FOR STUDENTS AND TEACHERS (FAST) SCASS

The purpose of this document is to share some examples of the Council of Chief State School Officers' (CCSSO) definition of formative assessment in practice[1]. The CCSSO definition of formative assessment developed and approved by the CCSSO Formative Assessment Advisory Group and Formative Assessment for Teachers and Students (FAST) SCASS is presented below:

> *Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes.*

The following are five attributes based on current literature that render formative assessment most effective.

Learning Progressions

Learning progressions should clearly articulate the sub-goals of the ultimate learning goal.

Learning Goals and Criteria for Success

Learning goals and criteria for success should be clearly identified and communicated to students.

Descriptive Feedback

Students should be provided with evidence-based feedback that is linked to the intended instructional outcomes and criteria for success.

Self- and Peer-Assessment

Both self- and peer-assessment are important for providing students an opportunity to think meta-cognitively about their learning

Collaboration

A classroom culture in which teachers and students are partners in learning should be established.

It is important that the reader first recognize formative assessment and what it is not before developing a more nuanced understanding of formative assessment. This is akin to learning to appreciate jazz. The first step is to be able to distinguish jazz from blue grass or funk. Recognizing the broad genre is an important prerequisite before moving on to learn about how the various aspects of jazz music such as blue notes, call-and-response, improvisation, and syncopation all work together to create a musical performance.

Therefore, there are two sets of vignettes. The first set provides very brief examples and counter-examples of formative assessment. The second set illustrates extended examples of formative assessment practices and the interconnectedness of the various attributes. The vignettes are taken from teacher observations conducted in a variety of schools across the U.S. These vignettes illustrate formative assessment practice across a range of grade levels and content areas. Each vignette provides a description of the classroom activities, followed by a brief analysis that relates the actions of the teacher and students to one or more of the five attributes of effective formative assessment. Note that a particular formative assessment practice may not exemplify all five attributes.

[1] Grateful thanks go to the various members of the FAST SCASS who contributed examples of formative practice and provided feedback on various iterations of this document.

VIGNETTE SET A:

IS IT OR ISN'T IT FORMATIVE ASSESSMENT?

Set A contains short descriptions of classroom practice. After each vignette, a brief rationale is provided as to why it is or is not formative assessment.

Vignette 1: Thumps Up and Thumbs Down

A high-school biology teacher frequently reads aloud a prepared biology-related statement, then asks students to hold their hands under their chins and signify whether the statement is true or false by showing a "thumbs-up" for true or a "thumbs-down" for false. Depending on the number of students who respond incorrectly the teacher may have students present arguments for both sides, he may pair students and ask them to discuss the concept further, or he may decide that he needs to present the same concept using a different representation or instructional approach.

This teacher is using a formative assessment approach to collect evidence to adjust instruction. This is, therefore, an instance of formative assessment.

Vignette 2: Structured Pair-Work

Each student is given an appointment clock and is required to make an appointment with three other students for discussion later in the lesson. Once all the appointments have been made the teacher begins the lesson, providing information and posing questions that require higher-order thinking about the information. The students are asked to reflect on the information and to answer specific questions. Then the students go to their first appointment and spend approximately 15 minutes sharing their thinking as it relates to one or two of the posed questions. They analyze each other's responses and come to consensus. As the students work with their partners, the teacher walks around and notes common misunderstandings and gaps in understanding. At the conclusion of the first appointment, the teacher uses the information gained during the informal observations to help redirect thinking, to reinforce ideas, and to provide cues that would help advance their learning. The students then go to their next appointment and class continues in this manner until all appointments have been met and all questions have been discussed.

This is an example of formative assessment where the posed questions and the peer conversations are used to elicit evidence of the students' understandings. In this context, the formative assessment process is embedded into the learning activity itself due to the teacher's careful engineering of the activity. The students are able to self-reflect and get feedback from their peers. The teacher is able to listen to the conversations between students to note the current level of understanding for the class and for individual students. The teacher uses the information immediately to assist students in their learning by redirecting thinking, reinforcing ideas, or providing cues.

Vignette 3: Collective Definitions of Success Criteria

The teacher provides students with an open-ended question related to a concept they are studying and asks the students to identify the information or details necessary for a response to demonstrate full understanding of the concept. A list of these details is recorded on the board. The teacher then provides students with examples of several student responses that were given by students in previous years. The students are asked to analyze the responses and to determine if the responses show full understanding, partial understanding, or no understanding of the concept. Students must justify their answers. As this thinking is shared, the list of details or supports necessary for a response to the question is further refined until a set of criteria emerges that students can use to self-assess and peer-assess their responses to the question.

In this example of formative assessment the teacher is provided with information about student learning and the process used to gather that information also requires students to reflect on their own learning. This activity provides the teacher with information about how well the students understand the concept and how best to demonstrate that understanding. To fully participate in the activity, students must reflect on their own level of understanding as they analyze the work of others and provide reasons why they think there are gaps in understanding.

Vignette 4: District-Developed Assessments

District-developed monthly exams are to be administered to all students at the end of each of the school year's first eight months. The exams are based on state-authorized curricular goals for the grade and subjects involved. Because district administrators insist that teachers send results of these tests home to parents, all teachers do so. Yet, because the content covered by the monthly tests typically doesn't coincide with what is being taught at the time the tests are administered, teachers rarely alter their instruction based on students' performances on the monthly exams.

In this example, we see neither teachers' adjustment of their instruction nor students' adjustment of their learning tactics. Thus, this probably well-intentioned distribution of the monthly exams' results to parents would constitute a counter-example of formative assessment.

Vignette 5: Classroom Quizzes

During a unit on photosynthesis, the teacher administers a weekly quiz that addresses all of the material covered for the week. The quizzes are supposed to motivate students to study for the summative unit as well as provide students with a sample of the types of questions they may encounter on the unit test.

This is not an example of formative assessment because the teacher does not use the evidence from the quizzes to adjust instruction, nor does the teacher provide direction to students for them to think meta-cognitively about their own learning. The only information the students receive is a score for the number of correct answers. This is an example of ongoing summative assessment, not formative assessment.

VIGNETTE SET B:

EXAMPLES OF FORMATIVE ASSESSMENT IN PRACTICE

In this set the analysis relates each vignette back to the five attributes of effective formative assessment. The attributes are characteristics or features of effective formative assessment that the literature suggests are important. As the vignettes illustrate, some instantiations of formative assessment practice do not incorporate all of the attributes. For example, a particular vignette might not involve self- and peer-assessment, but it could still represent formative assessment practice. However, a teacher with a well-developed repertoire of formative assessment practices incorporates self- and peer-assessment, as appropriate.

These vignettes should not be viewed as complete descriptions of how particular teachers operationalize the concept of formative assessment in their classrooms, but rather illustrative of aspects of that practice. One way to consider the vignettes is to focus on the ways that one attribute appears across multiple vignettes. For example, the vignettes can inform the reader about the many ways in which feedback can be used, or provide insight into variations in teacher and student collaborations.

Vignette 1: Language Arts, Upper Elementary

An upper elementary language arts teacher began the lesson by asking a series of planned questions about a story that students had just finished reading. The teacher first reminded the students about their reading learning goals for this week that focused on identifying the main idea and supporting details within a story. Her questions required careful analysis by the students, so the teacher structured her approach by asking students first to think about their answers as individuals and, then discuss their answers in small groups. Each group was to reach consensus on a single answer and that group answer was then shared with the rest of the class using Whiteboards that designated students held up. With this questioning and group work approach, the teacher was able to identify several groups of students who were having difficulty understanding the concept. Summaries of the main idea of the story varied widely in accuracy and clarity. As the lesson was nearing the end, she asked the students to look at the various groups' answers about the main idea, to select the one that they thought was the best answer,

and to write down why they made the choice they did. She had students answer using an Exit Ticket – index cards on which students wrote their individual answers and then handed to her as they left the classroom. This approach provided her with a quick way to review student thinking at the individual level, thus providing information that she could use to shape the next day's lesson.

Several attributes of effective formative assessment are illustrated in this vignette. As the teacher planned for this lesson to address the ***learning goal*** *about the identification of the main idea, she developed a series of questions to ask her students. In addition, she planned a systematic way to allow students to think deeply about the questions, and to share their thinking with her and with members of the class. For this to be accomplished, the teacher had, over time, established a learning environment that emphasized* ***collaboration:*** *students were used to working in small groups and using whiteboards was part of the routine so that the teacher could use these evidence-gathering approaches with little explanation required. Finally, to support the impression developed during the lesson about group difficulties, the teacher was able to elicit evidence of student learning using Exit Tickets, an approach that required little time to review. With this student-level evidence of understanding she was able to tailor her lesson the following day to capitalize on those students who had a deeper understanding of the learning goal. By incorporating various formative assessment strategies during a single lesson, the teacher deepened her understanding of where her students were in their learning, and gathered evidence to inform her instructional decision making.*

Vignette 2: Mathematics, Upper Elementary

A fifth grade mathematics teacher had been working with his students in the area of data analysis, and had recently introduced the class to the concept of using measures of central tendency to summarize data. He was aware of several of the typical misconceptions that students had about the concept of "median." In particular, he knew that students often did not think that ordering the numbers in a data set was a necessary first step, and that students often did not understand how to handle data sets with an even number of elements. He wrote two multiple-choice questions to address these common misconceptions.

At the start of the lesson the teacher reviewed what they had covered in regards to measures of central tendency. He also wrote the learning goal on the board: "Today we will learn how to select appropriate measures of central tendency."

Students had been using electronic clickers for the opening questions in mathematics class each morning. As a quick review of previous lessons, the teacher presented both multiple choice questions to the students. Almost all students answered the two questions correctly. He was about to begin to address the goal for that day's lesson, when a student asked, "But there could be two answers, couldn't there?" He asked the student to explain his reasoning to the class. The student explained that the problem could be solved in two ways – either select the middle number in the set, or put the numbers in order and then select the appropriate number. The teacher decided to poll the class and asked how many agreed with the student's explanation of two possible answers. Just over half the class agreed that the problem could have two different answers.

The teacher, on-the-fly, wrote up two identical data sets on the board, each with five terms, except one set was ordered and the other was not. He asked students to think on their own and then discuss with a partner to decide whether the two sets had the same median value. As students discussed this with a partner, the teacher circulated around the groups, making some notes of what he heard in the conversations. After about 10 minutes, he polled the class a second time, and now much fewer than half the students thought that the two sets had different medians. From the notes that the teacher took as he listened to students, he was able to identify several students who had very clear explanations for why the two sets had the same median value. He called on those students first to share their thinking with the class, and then asked students who disagreed to give their explanations. One student who had not previously been convinced by her partner shared her new understanding with the class. The teacher decided that the class was now ready to move on to the planned part of the lesson, but made a note to return to this problem for the class warm-up in a couple of days.

Several attributes of effective formative assessment are illustrated in this vignette. The teacher had a clear understanding of the ***learning progression*** *that he wished to move students through on their way to learning the larger* ***learning goal*** *of applying and interpreting measures of central tendency. He also was aware of common misconceptions that students have or develop in this particular area, and so created two questions to get at those misconceptions. Although students answered his questions correctly, he was still sensitive to the additional evidence provided by the one student who asked the question, and supplemented that evidence by a quick class poll. Realizing that although students*

were able to complete the procedural steps to find the median value, they clearly did not understand the concept yet, he adjusted his instruction by creating an additional question for them to discuss in pairs. He continued to collect evidence systematically, both through listening to students' conversation and through another poll. After facilitating and guiding students' conversations the teacher decided that the class was ready to move on. However, he planned to return to this concept in a couple of days to check that the students had internalized the concept. This teacher used multiple sources of evidence in an effective way: planned questions at the start of the class; class polling to get a sense of the students' thinking; and listening to student conversation.

Vignette 3: Mathematics, Middle School

A middle school mathematics teacher established a start-of-class routine with her students that she called "Homework Help Board." Twice a week the teacher would assign problems for students to complete as homework. As students came into class the following day, they would review their homework and identify any problems with which they had difficulty. They would write that problem number on the board. A student who had been able to successfully complete the question would write the solution on the board. This process was followed until all identified problems had correct solutions. If another student had a different approach to solving the same problem or a different answer, that student would post the alternative solution.

If there were alternative correct solutions to any one problem, the teacher would point that out and ask students to discuss the different approaches. If something was incorrect, the teacher would ask the class if someone could correct the problem. If a problem had been noted on the board and no solution provided, the teacher would then review that problem, suggesting perhaps a first step or something to think about to see if a student, with support, could complete the solution. If all problems had a correct solution on the board, the teacher would either begin the lesson directly or perhaps ask one or two questions as a check to be certain all students understood the concepts.

Usually the teacher was able to begin the lesson quite quickly as students had been able to resolve all the homework questions themselves. When students struggled to do this, she modified her instruction as necessary for that day or the following day in order to review or revisit the topic.

*This formative assessment example focuses primarily on the **collaboration and self- and peer-assessment** attributes of effective formative assessment. Students had to **self-assess** their homework efforts, and the classroom culture emphasized collaboration so that students were willing to take a risk and share their approach to a problem that another student had encountered. This approach was a form of systematic data collection: the teacher was able to identify across the entire class which homework problems had caused difficulties. The teacher was able to decide whether to react to this information extemporaneously or whether a more detailed response in a subsequent lesson might be necessary. Either way, the information collected by the teacher would cause her to adjust instruction to improve student learning. The students' solutions on the board also provided some teaching opportunities to have students think about multiple solution strategies, a particularly valuable approach when students use different representations to display their thinking.*

Vignette 4: Language Arts, Lower Elementary

A lower elementary teacher had been working with his students on how to use the writing process to improve their own writing and to assist their peers. They were all working on writing personal stories around the topic of animals to publish in a class magazine. He introduced the idea of *Two Stars and a Wish* as a way of providing feedback which requires the reader to identify two positive aspects of the piece of work (the stars), and one specific suggestion for improvement (the wish). He began by explaining that the feedback he had given on their writing adhered to this very same principle. Now students would use the Two Stars and a Wish approach as they worked with each other in their writing groups. They discussed as an entire class the types of comments they might write when addressing positives aspects as well as comments to write when suggesting improvements. They also discussed the types of comments that would not be appropriate to write to a peer.

The teacher then reminded students about their current writing project. He returned the writings to each student, and asked them to reread their essays and to review his comments. He then directed them to discuss with their partner the feedback given and specific ways they might improve on their next draft. During the student discussions, the teacher circulated the room, offering suggestions to those who had difficulties planning their next steps.

During the next lesson, the students revised their work, and then began peer editing using the Two Stars and a Wish approach He reminded them of the conversation they had about appropriate and inappropriate comments, of the type of comments he had written, and of the purpose of writing these stories to share in the class magazine As students peer edited and provided feedback to their partners, the teacher again circulated the room and made suggestions, as necessary.

The sharing of the feedback process was repeated and students then had an opportunity to make final revisions before submitting their final work for inclusion in the magazine.

This example focuses on the following attributes of effective formative assessment: ***collaboration****, the use of* ***descriptive feedback*** *and* ***self- and peer-assessment****. The teacher introduced a new structure for the students to give feedback to each other. The collaboration between and among the teacher and the students was evident in the way that he modeled the feedback approach and also gave students an opportunity to think about appropriate and inappropriate comments to write. The feedback provided by the teacher not only modeled the approach, but also was part of the learning process. An important aspect of this instruction was that the teacher provided a structure for the students to review the feedback, and decide what they would do in the light of the feedback, using a peer as a sounding board, in order to stimulate action. Giving feedback without the time to react to it is of little value. When it was time for the students to analyze the writing of their peers, the teacher revisited the earlier discussion about the structure of Two Stars and a Wish and the types of appropriate feedback. The peer assessment was done in quite an informal way, without descriptions of performance levels, but the students had a clear purpose and audience for the writing, and the Two Stars and a Wish approach provided structure.*

Vignette 5: Science, Middle School

A middle school science teacher decided that her eighth grade students were not benefiting as much as they could from the science inquiry experiments around which she structured her units. Her goal was that each week students would complete a lab report and, as part of the report, connect what they learned from the experiment to the "big ideas" that she was presenting throughout the unit. However, she realized that students were struggling with the lab report content, and she was spending much of her grading time commenting on earlier sections of the report rather than focusing on the connections that they were making to the big ideas. She had been using a "criteria-for-evaluation form" that described her expectations for the reports, but decided that it needed to be revised so that it was more easily understood by the students. Because the form was to be used by the students as they prepared their lab reports, she decided to allow the students help her in designing the new instrument.

Before the start of the new school year, she pulled four student lab reports from the previous year, removing all identifying information. During the first class, she reviewed the criteria for evaluation form, and then handed out the four student reports. Working together in small groups, she asked the students to rank the reports, using the evaluation form, and to justify their ranking. A member of each group was randomly selected to explain his or her analysis of one of the reviewed reports. Other students were then allowed to add their comments. Once all four reports had been ranked and discussed by the class, she presented the rank order based on her grading of the reports and tied it back to the criteria-for-evaluation form. She responded to student questions about her scoring of the reports. She then reviewed again the purpose of the experiments and the write-ups, to help them better understand and make connections between their results and the big ideas of the course. She challenged the students to improve the criteria-for-evaluation form by creating their own check-lists that would help them do a better job on the lab reports.

Students then went back to their small groups, and reviewed again the two higher scoring lab reports, against the criteria-for-evaluation form; discussed how to describe the important aspects of the reports in their own words and from there developed their own list of important criteria. A second class period was spent compiling the ideas from each group, creating a final criteria list, and ensuring common understanding.

For each lab report that students completed during the year, students were reminded to compare their own work against the criteria list as a first check. Then the teacher allowed 15 minutes of class-time each week, for students to exchange draft reports with another student and to provide feedback. Students used the criteria list as they peer-evaluated the reports and followed a 2 + 2 feedback strategy (two positives and two suggestions for improvement). Students then made any final revisions that evening before submitting final draft.

The teacher discovered that students were better able to understand her expectations using the student developed criteria list, and that the quality of the lab reports increased significantly, along with greater depth of student thinking. Furthermore she was able

to spend more time focused on the connections that students were making to the big ideas which in turn was helping her plan her instruction better having a clearer sense of what they were still struggling with and what they understood.

*This formative assessment example focuses on several attributes including **collaboration** between and among teacher and students, and **self- and peer-assessment.** The teacher structured her instruction around a **learning progression**, using a sequence of inquiry experiments that were intended to help students develop understanding of several "big ideas". Recognizing a weakness in her process, she engaged her students **collaboratively** to develop lab report criteria list that they clearly understood and that would help them improve the quality of their reports. Students were then encouraged to engage both in **self-assessment**, to monitor their own work against these criteria, and then to engage in **peer-assessment** by using the criteria to review the lab report of another student. Time was built into the regular classroom schedule allowing students time to incorporate the **descriptive feedback** before handing in their reports. In addition, as the quality of the reports improved, the teacher was able to attend more to the content that was most critical to the overall learning. As a result she was able to use that information to adjust teaching in the light of student learning.*

Vignette 6: Economics, High School

An important concept in a high school economics curriculum is that of supply and demand. The high school economics teacher knew that his students needed to have a firm grasp of the five determinants of demand and the six determinants of supply in order to understand how all the variables interacted to determine pricing.

After introducing the five determinants of demand, the teacher showed a movie clip from *Hudsucker Proxy* that shows a sudden change in price of a product due to a change in one of the five determinants. The teacher then asked students to identify which of the five determinants it was and to justify their response. From the student responses, the teacher was able to identify those who had understood the content and those who had not. He had an already-prepared worksheet for those who did not yet grasp the concept and he worked with this small group of students, using the worksheet to identify and address areas of misconception. Students who had answered the question correctly were able to begin the homework assignment which reinforced the concept covered in class while the teacher worked with the other group.

The teacher repeated this process for the six determinants of supply, using a clip from *Forest Gump*, and again asking students to identify which determinant was involved. Again, he worked with the students who did not understand and allowed those who did to begin the reinforcement activity.

*The key attributes of effective formative assessment in this vignette is that of the learning progressions. The teacher had a clear understanding of the **learning progression** that he wished to move students through in addition to the subsidiary **learning goals** within the topic. He anticipated key junctures in the unit on supply and demand and embedded an assessment point into his instruction that allowed him to quickly determine students' understanding of the determinants. Importantly, he had a plan of action prepared ahead of time of what he would do to support student learning both for those individuals who did not yet understand the content, and for those who did. If students did not grasp this concept, moving on to interpreting supply and demand graphs would be pointless.*

Vignette 7: History, High School

A history teacher created an end-of-year research project for students to work on over a period of several weeks. The goals of the project were to enable students to gain a broader perspective on domestic policy across 60 years of history, and to develop their research skills. Each group was assigned a different decade between the 1950's and 2000. Students were given guidelines regarding the structure of their 15-minute presentation as well as specific criteria for the study notes that they had to create. Each student within the group had to responsible for a piece of the presentation.

The first step was for students to identify important policy issues for their assigned decade and to develop a research plan for deepening their understanding. Each group met with the teacher for feedback on their list of identified issues and their plan for tackling the project. Since the teacher wanted students to learn from each others' presentations and notes, he met with each group on a regular basis to monitor progress, to give them an opportunity to reflect on their group's progress and next steps, and to provide feedback on their presentations and draft notes. A few days before the final presentations were to be made, the groups were paired so that they could listen to each other's dress-rehearsal presentations and give each other feedback on the notes, the content of the presentation and the delivery using the 2+2 format to note two positive aspects and two aspects that could be improved. The teacher then met with each group to review the feedback they had

received and to discuss possible solutions to issues or concerns.

The teacher created an end-of-project multiple-choice assessment that was based on the content across all the presentations. In addition, the year-end essay required students to analyze themes and patterns in domestic policies across the decades.

*This is an example of a complex project that required students to become experts in a particular decade so that they could teach their peers. This example illustrates how formative assessment is part of the balanced assessment approach. Because of the structure of the final summative assessment (multiple-choice quiz and essay) students had to use the presentations of their peers and the study notes to become familiar with the major events, influences and policies of the other decades. Within the extended project there are multiple aspects of effective formative assessment practice. The teacher monitored and guided student progress and gave students **descriptive feedback** along the way. He encouraged them to be **self-reflective** of their own progress and to use **peer assessment** strategies to give feedback to another group.*

Vignette 8: Band/Orchestra, High School

The band teacher worked through a section of a musical piece with the class that was selected because it contained several challenging sections that would require students to apply some of the recent lessons. As the band played through a particular measure of music he noticed a sour note. He stopped the group and asked whether anyone has noticed anything. Several students indicated that they noticed some off-notes towards the end of the section. He then asked everyone to look at the second to last measure in the section. He asked everyone to play that measure and hold each note until directed to play the next one. By doing this he was able to help the students isolate the instruments that were playing the wrong pitch.

On occasion this approach results in the students discovering for themselves that they are using an incorrect fingering. In this case students were still unsure about what exactly needed to be corrected. However, a couple of students volunteered to the class that they heard the wrong pitch in the trumpet section in the second beat of the measure. The teacher then asked the trumpets to hold up their instruments so he could see the valves and then hold down the fingering for the note(s) in the second beat of the measure. He then had the students observe the fingerings they had used. It was obvious where incorrect fingerings were applied when students looked at each other's instruments and the correction was made immediately. A final check of understanding required the students to play the measure again by holding each note and checking for correct pitches.

*This is an example of how small the grain-size of a formative assessment can be. There is only a fine line between the instruction and the assessment process so that the assessment is part of the instruction. In addition to working on playing the particular piece of music the teacher is also developing students' musical ears so that they can identify problems, and then correct them. He encourages students to listen to each other and to observe each other in order to **self-assess** themselves.*