



THE TEACHING DOCTOR

Illuminating Evidence-Based Ideas for Effective Teaching

Spring, 2008

IN THIS ISSUE

We describe the qualities of formative assessment and provide ideas for incorporating formative assessment into your teaching.

Formative Assessment...

- Is part of the learning process
- Is used to improve learning
- Enhances intrinsic student motivation
- Can be used to improve teaching.

Summative Assessment...

- Takes place at the end of the learning process
- Is used for accountability
- Impacts on extrinsic student motivation.

Previous Topics:

How to make your lecture work.
Fall 2007, <http://meds.queensu.ca/ohse/newsletter>

"Evidence base is as important in educating new doctors as it is in assessing a new chemotherapy."
Stewart Peterson, Professor of Medical Education, Leicester

IMPROVE LEARNING THROUGH FORMATIVE ASSESSMENT

"...Formative assessment is critically important for student learning. Without informative feedback on what they do, students will have relatively little by which to chart their development."

Yorke, 2003

We are all familiar with summative assessment, where teachers measure the achievement of learning goals at the end of a course. Formative assessment, however, provides feedback to students that can be used to improve their learning. Think of formative assessment as assessment *for* learning while summative assessment is assessment *of* learning.



Students gauge their understanding through an in-class discussion.

What Is Formative Assessment?

Formative assessment is defined as "information communicated to the learner that is intended to modify his or her thinking or behaviour for the purpose of improving learning" (Shute, 2008, pg.154). It is part of a feedback process in which a learner is able to evaluate their response in light of the information received, and make adjustments. It can be used to:

- Identify gaps in knowledge
- Help novice learners to identify important information
- Connect procedural errors or misconceptions.

Feedback generated through formative assessment can also be used to improve teaching.

Why Provide Formative Assessment?

- Enhances motivation to learn
- Helps students identify gaps in knowledge
- Fosters self-study
- Clarifies desired outcomes
- Diagnoses specific misunderstandings.

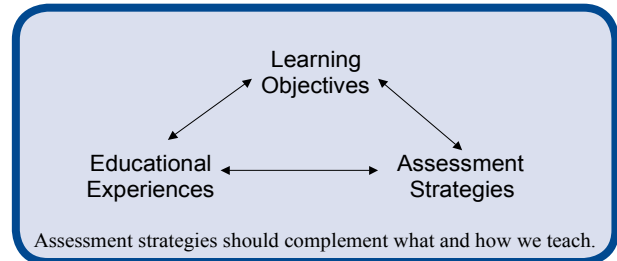
In summary, formative assessment allows students to make adjustment to what and how they are learning. Feedback can also be used to make immediate adjustments to what and how you teach.

Formative assessment or good feedback can significantly improve learning processes and outcomes...if delivered correctly.

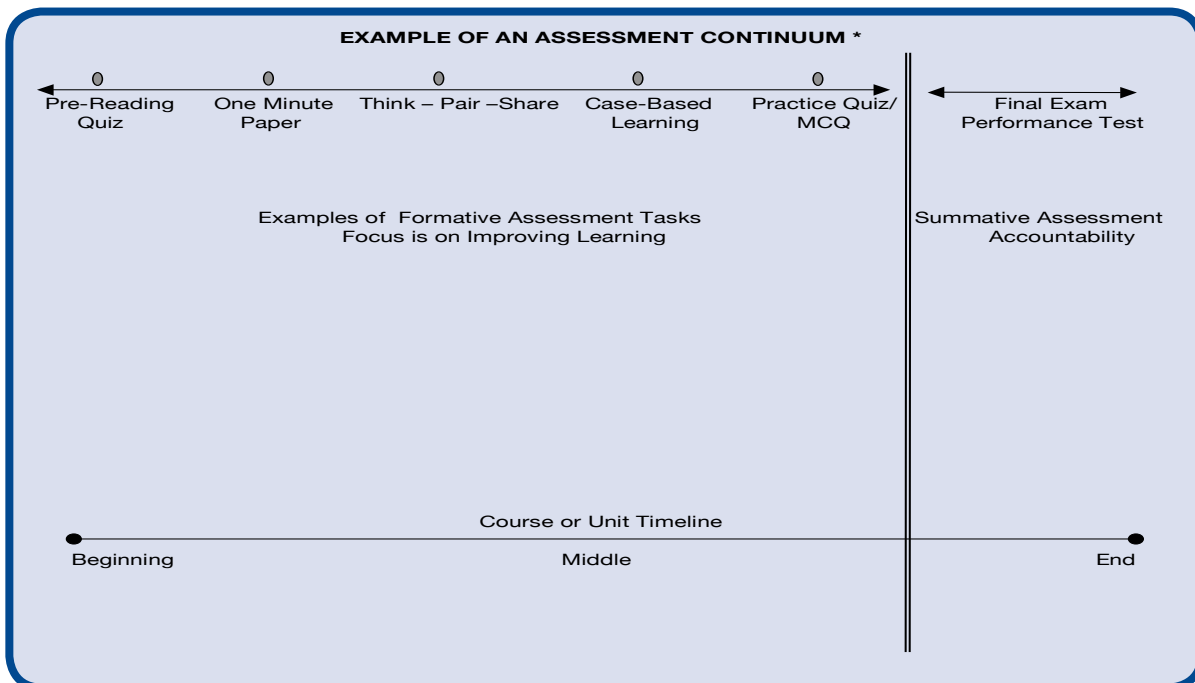
Please read from the techniques, tools, and tips inside.

TECHNIQUES

Formative assessment can be directly integrated into the course or unit, and specifically tied to the learning objectives. It may become a part of a planned lecture, case discussion, or Team-Based Learning Session. It may occur on-line in student self-directed activities, or as part of a class. It is part of the “feedback loop” or response to students in clinical learning situations such as clerkship or residency. It is simply good teaching where teachers select one or more techniques to provide feedback in order to assist students in their learning, and to determine how well they are meeting the learning objectives.



Think of formative assessment as part of a continuum where specific tasks are planned to provide feedback to students throughout the learning experience.



**Adapted from: McTighe, J. and Wiggins, G. (1999). The understanding by design handbook. Alexandria, VA: The Association for Supervision and Curriculum Development.*

When planning for assessment it is important to:

- Create clear criteria or performance standards against which student progress will be assessed
- Communicate criteria or performance standards to students well in advance of the assessment task
- Provide specific feedback based on the criteria or performance standards.

TOOLS

FORMATIVE ASSESSMENT IN LARGE OR SMALL CLASS SETTINGS

Pre-Reading Quiz:

A pre-reading quiz may be done on-line or in the class using a student response system. It is important to provide students with clear instructions regarding the task and your expectations. Students can be provided with the opportunity to re-take the quiz without penalty. The results may be used to provide students with feedback on specific areas for improvement or can help students to identify their own learning goals. The results may also be used to adjust the content of the session.

The One Minute Paper:

This is a highly effective technique for checking students' progress, both understanding and reacting to the course material. Ask students to take out a blank piece of paper, pose a question and give them a minute to respond. You can use this to generate a discussion or you can collect responses individually or from groups, to see if students are envisioning the material as you envisioned. (Sample on page 4)

Think - Pair - Share

Pose a question to the group. Give students a minute to jot down some points individually. Have the students turn to the person next to them and discuss their response. In a pair it is almost impossible to stay silent. Once they have spoken they are more likely to speak afterwards to whole group. You can then go on to have the groups expand - to work in fours, sixes, ect. In fours or sixes this is where the real work gets done. This actually allows the students to self-assess and get feedback from their peers regarding progress against learning goals. The teacher is left free to observe, reflect and provide helpful interactions.

Practice Quiz / MCQ

Students are tested after a learning session to guide future studying. This is most effective when students are provided with response specific feedback. Quizzes may be on-line or in class, perhaps with "clickers."

Case-Based Learning

The instructor models clinical decision-making; then, students in groups or individually work to synthesize material and arrive at a response or diagnosis on their own. This can be combined with Think-Pair-Share, Clickers or Question-and-Answer sessions.

How to make formative feedback effective:

- (a) Address the topic
- (b) Address the response
- (c) Discuss particular errors
- (d) Provide examples that work
- (e) Provide gentle guidance
- (f) Provide an opportunity for review

Using Portfolios

A portfolio is defined as "a collection of evidence that is gathered together to show a person's learning journey over time and to demonstrate their abilities" (Butler, 2006). This evidence is combined with self reflection. For portfolios to be effective mentoring is required for the assembly and interpretation of the contents. A portfolio can be specific to a particular learning task or can include a number of different products or activities...It is in the construction of the portfolio that learning takes place. For more about portfolios, see Friedman, Ben David, M. et al. (2001). AMEE Medical Education Guide No. 24: Portfolios as a method of student assessment. *Medical Teacher*, 23(6).

For more techniques, please see *Formative Assessment techniques are good teaching techniques*. Office of Health Sciences Education Website:
http://meds.queensu.ca/ohse/teaching_materials

ONE MINUTE PAPER

This is a highly effective technique for checking students' progress, both in understanding and reacting to the course material. Ask students to take out a blank piece of paper, pose a question and give them a minute to respond. You can use this to generate a discussion or you can collect responses to see if students are learning.

One Minute Paper

In order to prepare for the next sessions, it would be really helpful for me to know about your learning in today's session. Please take a minute to respond to the following questions.

1. Here's what I learned in today's lecture:

2. Here are some questions I still have:

3. Here are some things I don't even understand well enough to ask about:

Other comments or suggestions:

TIPS

“It has been recognized for many years and across all educational sectors that effective feedback is positively correlated with student achievement although it is also clear that the quality of feedback is vital.” (Wood, p. 8)

Guidelines for Providing Feedback*

Feedback is most effective if:

1. Feedback is provided in relation to pre-set learning objectives.

TIP: Work with a colleague to pick out key criteria for success on which to give feedback. Try creating or finding examples of excellent performance to share with students. Model process for students.

2. It is provided in specific, non-judgmental, behavioural and descriptive terms.

TIP: Use adverbs (which relate to actions) instead of adjectives (which relate to qualities) to focus on task vs. person. E.g. “You asked the question too generally,” vs. “You were vague.” “You listened carefully,” vs. “You were good.” Avoid “scolding.” Help prioritize areas for improvement.

3. The learner is motivated to take action to towards reaching the desired goal or level of performance.

TIP: Asking the learner to develop an action plan to address 1 or 2 issues allows them to take responsibility for improvement. Giving timely feedback allows time for remediation and improvement. For best results discussions should occur privately; avoid posting results.

*Adapted from Queen’s University Guidelines for Providing Feedback during Clerkship Rotations

Helpful Feedback Matrix

TIP: Monitor your ability to create a supportive educational experience, baed on providing helpful feedback.


<i>Unhelpful feedback</i>	<i>Reason</i>	<i>Helpful feedback</i>	<i>Reason</i>
‘Your body language wasn’t very good at the start’	Judgemental	‘At the beginning you were looking at the computer screen records and not at the patient as she started to tell her story’	Descriptive, detailed, behavioural
‘You weren’t very empathic’	Non-specific	‘You didn’t acknowledge the problems she has dealing with her husband’s illness’	Identifies specific problem
‘You’re very abrupt’	Personality issue	‘You interrupted a lot. For example...’ (give specific points in consultation)	Behavioural, specific
‘I think it would be better if you did it this way’	Advice	‘Have you thought about trying it like this?’	Generating alternatives
‘I don’t think you heard everything with your hearing problem’	Hearing problem not resolvable in this situation	‘You have always discussed your hearing problem with us. Was there any point at which you thought it was affecting the consultation?’	Supportive, possibly can be changed by altering environment
‘You didn’t notice how upset she was’	Judgemental	‘At one point she was looking down and appeared upset. You quickly continued by asking her direct questions about her medication and she never returned to the problem of what was upsetting her. Did you notice that?’	Descriptive, non-judgemental, specific
‘It was really good’	Non-specific	‘At the start you asked an open question and then allowed her to tell her story. You left silences so that she continued in her own words’	Positive, specific, descriptive

Source: Wood, D. (2007). *Formative Assessment*. ASME, p. 15.

TOOLS

FAMILY MEDICINE FIELD NOTES

Queen's University, Family Medicine, Formative Assessment Tool*

Field Notes: Department of Family Medicine 

Resident: _____

Evaluator: _____

Rotation: _____

Date: _____

Clinical Scenario:

Strengths:

Areas for Improvement:

Education Rx:

Resident Signature: _____

Evaluator's Signature: _____

"The Family Physician is a Skilled Clinician"
Residents in Family Medicine are required to record a minimum of 16 direct clinical observations per year.

*Used with permission, Department of Family Medicine, Queen's University

Feedback Grid: Offer feedback by beginning anywhere on the grid and working all the way around.

<p>Continue... Comment on aspects of performance that were effective. Be specific and describe impact. Highlight things that you would like to see done in the future.</p>	<p>Start or do more... Identify behavior the student knows how to do and should do, or do more frequently.</p>
<p>Consider... Highlight a point of growth for the student, a "do-able" challenge for future interactions.</p>	<p>Stop or do less... Point out actions that were not helpful or could be harmful. Be specific and indicate potential impact.</p>

Walsh, 2006

THE 1 MINUTE PRECEPTOR

Initially introduced as the "Five-Step 'Microskills' Model of Clinical Teaching" (Neher, Gordon, Meyer, & Stevens, 1992), the One Minute Preceptor strategy has been taught and tested across North America (Irby 1997a, 1997b; STFM, 1993) and has been welcomed by busy preceptors.

1 Minute Preceptor	
Microskill	Examples
1. Get a Commitment	"What do you think is going on with this patient?" "What other types of information do you feel are needed?" "What would you like to accomplish in this visit?" "Why do you think the patient has been non-compliant?"
2. Probe for Supporting Evidence	"What were the major findings that led to your conclusion?" "What else did you consider? What kept you from that choice?" "What are the key features of this case?" "What questions are arising in your mind?"
3. Reinforce What Was Done Well	"You didn't jump into solving her presenting problem but kept open until the patient revealed her real agenda for coming in today. In the long run, you saved yourself and the patient a lot of time and unnecessary expense by getting to the heart of her concerns first." "Obviously you considered the patient's finances in your selection of a drug. Your sensitivity to this will certainly contribute to improving his compliance."
4. Give Guidance About Errors and Omissions	"You may be right that this child's symptoms are probably due to a viral upper respiratory infection. But you can't be sure it isn't otitis media unless you've examined the ears."
5. Teach a General Principle	"If the patient only has cellulitis, incision and drainage is not possible. You have to wait until the area becomes fluctuant to drain it." "Patients with cystitis usually experience pain with urination, increased frequency and urgency of urination, and they may see blood in the urine. The urinalysis should show bacteria and white blood cells, and may also have some rbc's."
6. Conclusion	"OK, now we'll go back in the room and I'll repeat the lung exam and talk to the patient. After, I'd like you to help the nurse get a peak flow, a pulse ox, and a CBC. When we've gotten all those results, let me know and we can make a final decision about the need for hospitalization and our treatment plan." The teaching encounter is smoothly concluded and the roles and expectations for each person are made clear in a way that will facilitate further learning and optimal patient care.

Adapted from 5 Microskills for Clinical Teaching <http://clerkship.fammed.washington.edu/teaching/Appendices/5Microskills.htm>

MORE TIPS

- **Effective feedback provides the learner with both verification and elaboration:**

Verification: Confirms whether an answer is correct or incorrect.

Elaboration: Includes an explanation as to why a selected answer is wrong. The explanation may or may not indicate the correct response.

- **Feedback can be:**

Goal-Directed e.g. skills-related or

Response-Directed e.g. knowledge-related.

- **Feedback should be specific and not too complex or long.**

Evidence suggests that...

Response specific feedback, or elaborate feedback that directly refers to a learner's answer, is particularly effective in enhancing student achievement. E.g. "You considered ulcer as a potential cause of this case of abdominal pain. It's good to consider peptic ulcer as part of your differential diagnosis as that problem does get missed in adolescents. Meanwhile let's consider more common issues that arise in adolescents such as pregnancy or urinary tract infection."

Formative Assessment Is Feedback!

“Learning without feedback is like learning archery in a darkened room.”

(Cross, 1996)

7 Principles of Good Feedback Practice

1. Clarifies what good performance is
2. Facilitates self-assessment (reflection) in learning.
3. Delivers high quality information to students about their learning
4. Encourages teacher and peer dialogue about learning
5. Encourages positive motivational beliefs and self-esteem
6. Provides opportunities to close the gap between current and desired performance
7. Provides information to teachers to improve teaching.

Adapted From: Nicol & Macfarlane-Dick, 2006

5 Myths about Formative Assessment

1. “Formative assessment doesn’t count.”

It can! While formative assessment doesn't have to be graded, teachers have the option to include formative assessment as a part of the grade, which students accumulate toward their final grade in a unit or course.

2. “Formative assessment has no impact on student learning or achievement.”

It does! Studies show that strengthening formative assessment produces significant learning gains. As well, formative assessment can enhance lifelong learning skills by helping students to self-regulate their learning. (*Black and William, 1998; Nicol & MacFarlane-Dick, 2006*)

3. “Formative Assessment takes up more of teaching time and effort”

It doesn't have to! Formative assessment techniques are often just good teaching techniques. For example, included are: planned questions and answer sessions, gauging student responses through the use of clickers, or providing online modules and self-study quizzes linked to in-class sessions.

4. “Formative Assessment = Multiple Choice Tests”

Indeed, MCQ items can form the bases for formative assessment. However, providing students with the opportunity to self-correct and self-study is an important element of formative assessment. So “taking up the test” is as essential as participating in the test.

5. “Students won’t ‘buy into’ formative assessment”

Motivation to learn actually increases when students see the gap between what they thought they knew and what they actually know. Therefore, feedback from formative testing can improve learning (providing the testing is not too frequent). (*Iverson et al, 1994, Bangert-Downes et al, 1991 in Rushton, 2005*).

SUGGESTED READINGS:

For many effective teaching and assessment ideas:

Angelo, T. A. & Cross, K. P. (1993). Classroom assessment techniques: A handbook for college teachers. San Francisco: Jossey-Bass Publishers.

For a good overview of theory and some examples especially for clinical learning situations.

Wood, Diane. (2007). Formative Assessment. AMEE.

For information and audiotapes on a specific tool:

The 1-Minute Preceptor. Monograph and Audiotapes. Ohio University Office of Faculty Development. Educational Resources and Services. Accessed at: <http://www.oucom.ohiou.edu/fd/monographs/microskills.htm>

Review over 30 formative assessment techniques with explanations:

Formative assessment techniques are good teaching techniques. Office of Health Sciences Education Website: http://meds.queensu.ca/ohse/teaching_materials.

RESOURCES

To follow up on any of the suggestions in this newsletter, please contact Sheila Pinchin at sheila.pinchin@queensu.ca. To see additional resources, please go to <http://meds.queensu.ca/eteaching/>

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The 1-Minute Preceptor. Monograph and Audiotapes. Ohio University Office of Faculty Development. Educational Resources and Services. Accessed at: <http://www.oucom.ohiou.edu/fd/monographs/microskills.htm>.

Walsh, Allyn. (2006). Working with IMGs: Delivering effective feedback. *The Association of Faculties of Medicine of Canada*. Accessed at: http://www.afmc.ca/img/EFB_en.htm.

Williams, R.G., Dunnington, G.L. & Klamen, D. L. (2005) Forecasting residents' performance—Partly cloudy. *Academic Medicine*, 80(5), 415-421.

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Yorke, M. (2003) Formative assessment in higher education: Moves towards theory and the enhancement of pedagogic practice. *Higher Education*, 45(4), 477-501.