Using formative quizzes for continuous learning and assessment

Adapted in part from Macquarie University’s iLearn application and Harry Tuttle’s ‘Education with Technology’ blog.

**What are formative quizzes and how can they be used and designed?**

Formative quizzes are an effective way of providing students with formative and ongoing feedback on their learning progress. They can show you and your students where they understand the course content knowledge, and where there are gaps in their knowledge or misunderstandings that require further attention.

These quizzes happen at various points during the course, and because they are formative rather than summative, they should be ‘low-stakes’ meaning that they should be for informal rather than formal, mark-bearing assessment. The purpose of the quizzes is to promote engagement with course content knowledge, rather than to assess students in a ‘yes/no’ or ‘pass/fail’ manner. For example, when you want your students to read before they come to class in order to prepare for a new lecture theme or topic, you can set a reading and a formative quiz that will guide their reading, and help them to test their understanding of the reading, albeit on a fairly basic level. Or, if you have finished teaching a section of your course and would like to see what students have understood, and what they can remember about what they have learnt, you could set a formative quiz that could help them (and you) to note understanding and misunderstanding, so that you can continue to teach the course with a better sense of how your students are coping. This makes your teaching more responsive, and more informed.

Ideally these quizzes can be used to test memory and recall, and also basic reasoning. You can set up the quiz to allow students multiple or unlimited attempts so they can self-test and revise content. Using an e-learning or online format, quiz question types such as multiple choice, true/false, and matching are automatically marked. You can also pre-populate comments to give students instant feedback depending on their answers (see example below). The advantage of online quizzes is that students can do them in their own time. Another option is to use a slate and clickers, and host an interactive formative quiz in class where students have opportunities to buzz with their peers about the answers and vote anonymously. You can then see immediately which answers have been the most popular and discuss why the correct answer is correct and why the other options are not, so that students understand where they went right or wrong. A low-tech version of this is to hand to each student 3 or 4 squares of coloured paper (depending on how many options are in your MCQ questions) and put up questions on a projector or document camera. Students can still buzz and vote with coloured paper to match the colour coding on your questions (i.e., a is pink; b is blue and so on). Then you can still see, immediately, what students are answering and can engage them in a process of explanation and discussion about their responses.
The following are examples of online quizzes from iLearn at Macquarie University (https://www.mq.edu.au/iLearn/resources/quiz_formative.htm).

An example of a quiz question with feedback given for the correct answer:

Each of the three sentences to follow contains two simple propositions. Are those propositions both asserted, or is only the compound asserted? The members search party were tired, but they could not give up.

Select one:
- a. Both propositions are asserted.
  Right. This presents "The members of the search party were tired" and "they could not give up" as true, so they are both asserted.
- b. Only the compound is asserted.

Correct
Marks for this submission: 1.00/1.00.

An example of a quiz question with feedback given for an incorrect answer, including why the answer they selected was incorrect:

Each of the three sentences to follow contains two simple propositions. Are those propositions both asserted, or is only the compound asserted? The members search party were tired, but they could not give up.

Select one:
- a. Both propositions are asserted.
- b. Only the compound is asserted.
  No. "but" functions here just like "and". The sentence asserts both that the members of the search party were tired and that they could not give up.

Incorrect
Marks for this submission: 0.00/1.00.

What are the benefits for lecturers and for students?
In terms of all forms – low and high-tech – of formative quizzes:
- Students can self-test understanding of fundamental concepts.
- Students can get a look and feel for upcoming exams.
- Students can gauge their own exam readiness.
- Staff can receive feedback on how their class is tracking.
- Staff can save marking time.
(Macquarie University)

In terms of online practice or formative quizzes:
- Students benefit greatly from being able to take online practice quizzes. These quizzes focus on the critical lower-level thinking learning for the students. The students can practice these activities on online quizzes, therefore, freeing up class time for higher-level thinking activities.
- Students do not have to wonder if their answer is correct or not as they answer a question, the quiz programme tells the student. Students get immediate reaction to their answer; they do not have to wait until the next class which may be 24 hours, 48 hours or more away.
- Students can read the teacher-provided strategy for improvement for each wrong answer. The students do not just know that they are incorrect but they see an explanation of how to improve. They learn how to do it correctly; they improve through formative assessment.
- Students can begin to use their new strategy as they encounter a problem using the same concept that they just missed. They can verify if they are applying the strategy correctly.
- Students can answer without feeling badly about having a wrong answer as can happen in a class. No other student knows.
- Students can retake a practice quiz as often as they want to improve their score. If the practice quizzes are truly formative then no mark will be recorded. Students will demonstrate their learning in class and on summative tests.
- Teachers can quickly analyse in what areas students are successful and in what areas they have demonstrated learning gaps. They can select an appropriate learning strategy for each student for class.
- If formative quizzes are used for homework, then lecturers can use them to mark and give feedback (if set up to do this). Lecturers then do not have to individually mark a lot of scripts or explain individually to each student which answers are incorrect and what strategy will work for each incorrect answer.
- Both students and teachers can see the students’ progress over time as they see the online quiz scores. In addition, lecturers may notice patterns over time and can adapt their teaching and learning strategies to address students’ learning gaps and misunderstandings accordingly.

(Adapted from Harry G Tuttle’s blog)

**When not to use a quiz for formative feedback?**
- Questions that require students to write answers freely. These must be manually marked which is time consuming in a quiz. Assignment or Turnitin is recommended instead.
- When assessing higher order skills such as analysis and application.

Further information and resources can be found on the Resources page on the Teaching and Learning website, under ‘General pages’. Lecturers wants to find out more information about how to use clickers or Mxit for formative quizzes can also contact Mr Ronald Arendse, who is a Teaching and Learning Fellow and a lecturer in the Accounting department.

**Web references**
Macquarie University’s iLearn dept (quick guide on formative quizzes): [https://www.mq.edu.au/ilearn/resources/quiz_formative.htm](https://www.mq.edu.au/ilearn/resources/quiz_formative.htm)