

ASSESSMENT TYPES

There are several assessment types in education, we highlight three types in this report. All three types assist the instructor in gathering information about the student performance in order to help them improve, correct, learn, and to measure whether they attained the knowledge as specified by the stated learning outcomes.

Diagnostic Assessment: Assessment **AS** Learning

Diagnostic assessments are implemented at the beginning of instruction to collect data on what students already know about the topic, and whether they need remedial work before introducing new content. It can also let the instructor know if the students already know the content and if the lessons need to be modified to be more advanced to meet the students' needs. The goal is to get a glimpse of where students are in their knowledge, whether intellectually, emotionally, or ideologically. This type of assessment allows the instructor to make sound instructional choices in choosing course content and what approach to take in instruction.

Diagnostic Assessment Methods:

1. Written questions: multiple choice or short answer.
2. Pre- and post-tests, which allows the instructor to measure growth.
3. Self-assessments or reflections based on specific competencies.
4. Discussion responses based on specific content and prompts.
5. Interviews with each student separately, this may work with small enrollment courses.
6. Observations of student performance based on competencies.

Graduate/Professional Education Examples:

- Medical Education: Administering a pre-clinical diagnostic quiz on neuroanatomy prior to a neurology module to determine baseline knowledge and identify gaps for targeted teaching
- Biomedical PhD Programs: Assigning a literature critique on a seminal paper in molecular biology at the start of a course to gauge research literacy and familiarity with experimental design

Formative Assessment: Assessment **FOR & AS** Learning

Formative assessment is extremely popular in the k-12 space; however, it has been mostly overlooked in higher education. It is administered during the instructional process where the instructor provides feedback allowing the student to improve, hence why it is labeled assessment **FOR** learning, since through feedback it can be implemented as a learning tool. Formative assessment measures and

improves student progress and performance, but it can also be used as a gauge for teaching and content evaluation. This type of assessment is typically not graded but can be. It acts as a gauge to students' learning improvement and to determine teaching and content effectiveness.

When using self and peer evaluations in formative assessments, they are referred to as assessments **AS** learning.

Additional applications of formative assessment is to gauge student progress and guide program and course improvements. ABET defines formative assessment as: "... assessment done early in the program to determine the progress students are making towards achieving the intended outcomes. These data are used to guide program (or course) improvements."

Formative Assessment Methods:

1. Presentations: Students present project, knowledge, etc.
2. Observations during in-class activities
3. Elevator speech
4. Reflections, with regular feedback
5. Question and answer sessions
6. Performance: Students perform a snapshot of a final project
7. Quiz with immediate feedback for learning
8. Minute paper

Graduate/Professional Education Examples:

- Medical Education: Using structured direct observation tools (e.g., Mini-CEX) during clinical rotations to provide formative feedback on communication and clinical reasoning skills
- Biomedical Graduate Education: Implementing peer review of research proposals in a grant writing course to improve clarity, logic, and feasibility before final submission

Summative Assessment: Assessment **OF** learning

Summative assessment measures whether the learning has been achieved, and it takes place at the end of a unit, course, or program. It is highly recommended to develop rubrics, mapped to set of standards and learning outcomes to measure learning in summative assessments.

High-stakes summative assessments occur at the end of a semester or at key points where assessment a unit or set of instruction is completed. These types of assessments have two outcomes: 1) assessment of learning objectives for the unit or a course; 2) a grade output indicating the student has an acceptable level of knowledge to effectively progress to the next level.

Diagnostic assessment establishes what the product should be, formative assessment focuses on the process for completing the product, and summative assessment assesses the final product.

Summative Assessment Methods:

1. Examinations: high-stakes and final exams
2. Final papers (drafts of the same paper submitted for feedback before final submission are formative assessments)
3. Projects
4. Portfolios
5. Performances
6. Presentations

Graduate/Professional Education Examples:

- Medical Education: Administering an Objective Structured Clinical Examination (OSCE) to assess competency in patient interviews, physical exams, and clinical decision-making
- Graduate Biomedical Programs: Requiring students to defend their thesis proposals before a faculty committee as a summative milestone for advancing to candidacy

Comparison Table of the Three Types of Assessment



Diagnostic

1. Beginning of unit
2. Evaluate prior learning
3. Evaluative
4. Diagnose skills
5. Outcomes driven
6. Establish content



Formative

1. Ongoing
2. Evaluate learning over time
3. Incremental
4. Improve performance
5. Outcomes driven
6. Assess content over time



Summative

1. End of unit
2. Measure sum of learning
3. Comprehensive
4. Validate achievement
5. Outcomes driven
6. Assess final content