

The Need for High-Stakes Cognitive Exam Analysis (and a tool to support programs)

In the past several years, there has been an increased emphasis on the requirement for programs to evaluate items on high-stakes cognitive exams and to document changes made as a result of that analysis. Questions arise regarding how to proceed with the process and what documentation is considered adequate.

The CoAEMSP Interpretations of the CAAHEP *Standards and Guidelines* currently includes the following language:

“Validity must be demonstrated on major exams, but methods may vary depending on the number of students. All exams should be reviewed by item analysis, which may include difficulty index (p+) and discrimination index (point bi-serial correlation).”

For programs using a commercial testing product, the program must demonstrate that the test items used are valid and reliable at a program level. Simply quoting the national validity and reliability information provided by the vendor does not adequately establish that the test items are valid and reliable for the specific curriculum of the specific program. The results of program-level review (based on program established criteria) must be documented as well as any changes to exams that resulted from the review. Programs with large enrollments may be able to employ recognized mathematical formulas.

Since the goal of every program is to graduate competent, entry-level paramedics the evaluation items used to measure competency in the cognitive domain is crucial. Competency infers critical thinking ability that utilizes assessment and problem-solving skills beyond the ability to merely recall basic knowledge of EMS care. Exam items should be meaningful, without bias, balanced as to content (blueprinted to standards and practice), well written (correct grammar and spelling), and always have a best answer.

High-stakes exams can come from several sources. Instructors may choose to write their own exam items; use or modify items from textbook test banks; utilize other test bank resources; or subscribe to vendor-based exams. In the vendor process, the exams may either be blueprinted with set validated items or programs may be provided with pre-reviewed items from which the instructor can choose specific questions.

Regardless of the method of item and exam development selected, high-stakes exams require considerable effort to develop, review, analyze, and validate. Items must be continually reviewed to determine how they perform and must be updated as the science of emergency care evolves. Instructor/program developed exams should always be a group project with review, discussion, and approval of instructional faculty and the program medical director.

There are a variety of methods to analyze exam statistics depending on the evaluation format (paper or electronic), the origin (program-developed or vendor-provided), and how the exams are scored (by hand review or machine scoring). The ability to analyze exam results effectively also depends on the number of students completing an exam. College based programs often have access to testing resources in the institution which can assist in the review and analysis process.

The CoAEMSP presented a webinar on Written Exam Analysis that can be found [here](#). Instructors are encouraged to use this resource to better understand the analysis process and the accreditation expectations.

Failure to demonstrate how high-stakes cognitive exams are analyzed, along with evidence of subsequent changes based on the analysis, is a common accreditation citation during site visits. To provide some structure to the review process, a new Exam Analysis Form has been developed by the CoAEMSP that allows the Program an opportunity to document the exam statistics, evaluate the results, and identify changes. Find the Exam Analysis Form [here](#). In addition to the statistics, response cells include: content areas receiving unexpected low scores; recommendations from learning prescription if applicable; changes made to exam if applicable; strategies to address low performing areas; Program Director/Lead Instructor comments; and Program and Medical Director signatures. The Exam Analysis Form can be used to evaluate and document review for any type of exam format or structure. All high-stakes cognitive exams (e.g. any exam whose failure may result in a student being dismissed from the program) must be analyzed.

In summary, an important role of educators is to evaluate the comprehension of students on high level, critical thinking concepts in order to determine cognitive competency. Ensuring the quality of the examinations that educators use is central to that process.

See the Written Exam Analysis Webinar [here](#).

Download the Exam Analysis Form [here](#).