# ExamSoft

Psychometrics at a Glance

An exam is only as good as its questions, so it's crucial that assessment writers, instructors, administrators, and other stakeholders know how to evaluate each item. Not only must they know how well each item works to gauge learning, but how those items relate to the other items on the exam. This is where psychometrics comes in.

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Question Analysis

EXAMS
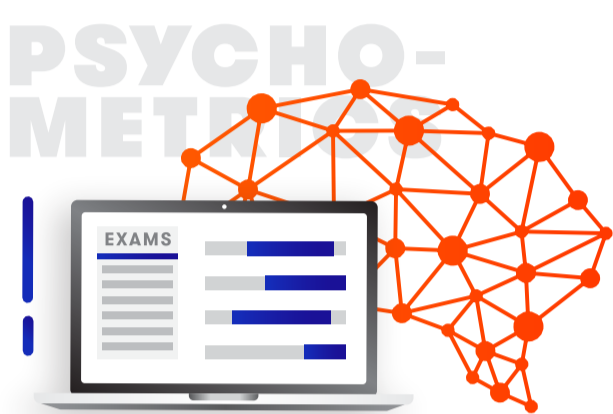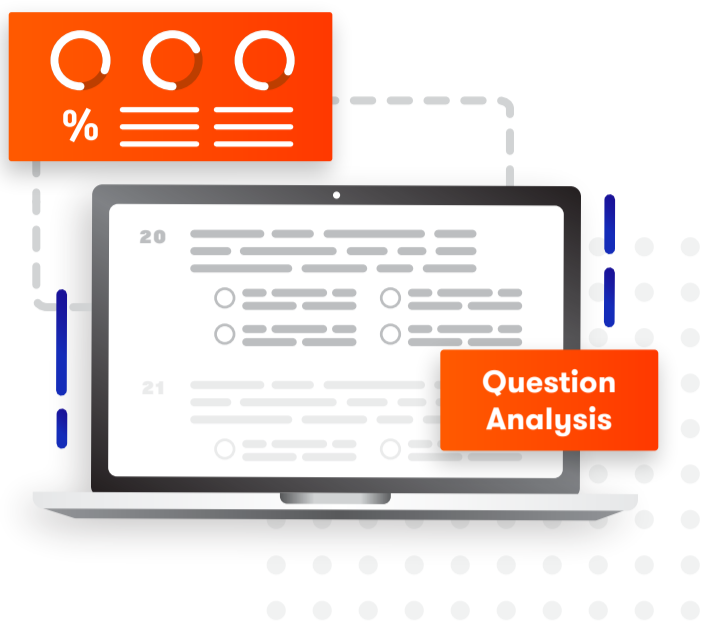
Psychometrics, a field of mathematics that focuses on psychological measurement often related to educational assessment, is extremely helpful when evaluating assessments in an objective way. Not only will individual psychometrics show you if your assessment measures the intended learning outcomes, but they also ensure a fair and equitable exam.

Below you'll find the primary psychometrics used in exam assessment, their definitions, and how they can improve your exams.

Item Quality

Difficulty Index

0 to 1

The number of exam-takers who answered the item correctly divided by the total number of exam-takers. (An indication of how "easy" an item is.)

0: The item was very hard - no exam-taker answered the item correctly

1: The item was very easy - all exam-takers answered the item correctly

Discrimination Index

-1 to 1

The percentage of high performers who answered an item correctly minus the percentage of low performers who answered the item correctly*. (An indication of how well an item discriminates between high and low performers).

-1: Substantially more low performers answered the item correctly than high performers

1: Substantially more high performers answered the item correctly than low performers

Point Biserial

-1 to 1

The correlation between the exam-taker's answer on a single item and the exam-taker's performance on the overall assessment.

-1: Exam-takers who performed well on this item performed poorly on the overall assessment

1: Exam-takers who performed well on this item performed well on the overall assessment

Exam Quality

Kuder-Richardson 20 (KR-20)

0 to 1

Note: A common cause for a low KR-20 value is a low number of test items.

The internal consistency or "reliability" of an assessment; the amount of error in an assessment score due to good (or poor) assessment construction; the degree to which an assessment is free from random error, yielding the same result across multiple administrations to the same cohort.

0: The test is unreliable and contains random error unassociated with content-specific difficulty and student comprehension

1: The test is highly reliable and would indicate the same rank order of student performance each time the test is administered to the same cohort

*Students who scored in the top 27% of assessment scores are high performers and students in the lowest 27% of assessment scores are low performers.

Reminder: Best practice is to view all of the psychometrics in context and all together. For example, interpreting difficulty without discrimination can be misleading.

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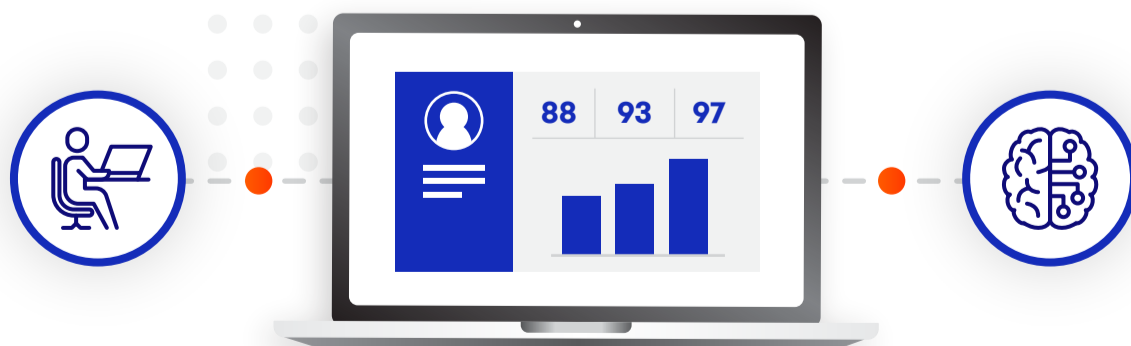
Exams should be true and objective measures of learning outcomes, and each question should support this goal. Using psychometrics and assessment data from ExamSoft, exam-creators can be assured that their exam serves its true purpose.

Be confident in your exam quality with ExamSoft.