CRASE®

Constructed-Response Automated Scoring Engine

Chart a course for speed, accuracy, and efficiency with automated scoring. Consistent, accurate, and reliable, our automated scoring engine meticulously scores student-written responses while providing cost savings and faster turnaround than hand scoring.

For practice tests or classroom-based testing, CRASE can deliver the first rating, with an optional read-behind by the teacher or a hand-scoring vendor.

CRASE® is the technology-based, scientifically engineered solution that immediately scores students' submissions to constructed-response test items. From short-answers and longer essays to technology-enhanced items, CRASE is proven to deliver accurate, reliable scores and achieve critical cost and time savings when compared with hand scoring.

- Reduce the personnel, facilities, and training costs associated with hand scoring.
- Include or retain constructed-response items in your assessments more affordably.
- Reduce teachers' grading burden.
- Provide students with feedback as they revise their response and enable students to submit their best response for teacher review.

HOW DOES CRASE WORK?

The CRASE engine analyzes a sample of human-scored student responses to produce a model that emulates human scoring behavior. Responses scored by CRASE flow through three stages:

1. **Preprocessing:** standardizes responses to prepare them for the later scoring stages.

2. **Feature extraction:** analyzes the response using Natural Language Processing tools to produce a set of numeric features that represent key elements of the rubric.

3. **Score prediction:** applies a statistical or machine learning model to the feature values to produce a rubric-based score.

PACIFIC METRICS
CORPORATION

CRASE demonstrated exceptional performance in the Automated Scoring Assessment Prize (ASAP) competition. The ASAP study examined nine automated essay-scoring engines across eight writing prompts and compared them with other engines and with human scorers.

SCORING SHORT-ANSWER ITEMS

CRASE models human rating behaviors by extracting key features from a student's answer and then combines those features into a score based on either a statistical or rule-based model, depending on the rubric. In scoring short-answer items, the system can provide feedback to students. CRASE can also score items with multiple parts.

SCORING NUMERIC-BASED ITEMS

CRASE scores items that ask students to graph lines or points as well as items that require computation. It is an excellent tool for scoring numeric responses because it processes the computations quickly and accurately and then assigns a score. In addition, CRASE can manage dependencies in numeric items and can score "solution plus explanation" items in which students are asked to explain their reasoning as well as provide solutions to problems.

SCORING WRITING PROMPTS

In analyzing student essays, CRASE looks for information based on the six traits aligned to Education Northwest's 6+1 Trait® Writing framework. These traits can be configured in different ways to reflect local standards. CRASE is able to score these traits based on your specifications:

- Ideas
- Organization
- Voice
- Word choice
- Sentence fluency
- Conventions

GETTING TO KNOW THE CRASE AUTOMATED SCORING SERVICE

CRASE offers both a generalized and a custom scoring service:

1. **Generalized essay scoring service** utilizes a generalized, pre-built scoring model that relies on complex algorithms. CRASE extracts information representing ideas, organization, voice, word choice, sentence fluency, and conventions to analyze student essays and provide scores for any teacher-written or client prompt.

2. **Customized automated scoring service** trains the CRASE engine to most closely mimic hand scoring for any item— CR, essay or TE, or prompt provided by our client. Pacific Metrics develops this model for clients upon request.

CRASE is a single scoring platform that has six scoring modules that can be combined to produce the best possible score.

- **Non-Attempt Scorer** | Catches non-attempts such as gibberish or off-topic responses
- **Constructed Response Scorer** | Provides feedback on two- to four-sentence short-answer items
- **Math Scorer** | Supports TEI graphing items and mathematical solutions, as well as equations/expressions
- **Short CR Scorer** | Scores one- or two-sentence short-answer item responses, searching for the presence of absence of key phrases
- **Cloze Scorer** | Supports cloze items or one-word/phrase responses
- **Essay Scorer** | Evaluates longer-form essay responses