Beyond Multiple-Choice:
UMass Enriches Adult Proficiency Tests with Engaging Interaction Types Using TAO

BACKGROUND

Founded in 1863, the University of Massachusetts Amherst (UMass) is one of the major public research universities in America. With more than 30,000 undergraduate and graduate students, and 1,300 full-time instructional faculty, UMass ranks 27th in a field of more than 700 public, four-year colleges and universities in the United States.

The Center for Educational Assessments at UMass has been developing and administering the Massachusetts Adult Proficiency Test (MAPT) in reading and math for

Adult Basic Education (ABE) students for 10 years. These students access educational programs offered by a range of providers across the state, including community colleges, adult learning centers, public libraries, and correctional facilities. Adult learners in these programs enter with math and reading academic skill levels between second and twelfth grade. The MAPT is used as a pre and post-test to measure improvements in students' basic literacy skills based on the ABE reading and math curriculum framework standards.

CHALLENGE

Finding an Item-Authoring Platform to Meet Multiple Objectives

The MAPT reading and math tests are computerized multi-stage adaptive tests, consisting of sets of questions that adapt to the learner's responses. The sets are automatically chosen based on how the learner responds to the previous questions. The sets of questions are drawn from a large item bank of more than 2,000 items for each subject area.

Since these item banks contain only multiple-choice questions, there are limitations on the types of knowledge and skills that can be measured effectively. Realizing this, UMass began searching for an assessment solution that would:

- Enable them to develop a much wider range of item types (including technology-enhanced items), and to embed graphics and videos. Ideally, this would expand their ability to measure a range of skills as well as providing an authentic way for students to respond.

- Support the measurement of higher-order skills required by the Common Core standards.

- Be certified to open standards, such as QTI, allowing ease of item export into the existing UMass item bank.

- Support item rendering across a wide range of test-taking devices, e.g., desktops, laptops, and tablets.

- Allow for easy delivery of pilot items and tests to ABE students across the state.

- Be user-friendly for item developers as well as the range of learners.

SOLUTION

Why TAO?

First and foremost, the fact that the TAO platform is Open Source made it very attractive to UMASS. "The essence of TAO is very collaborative. We've been impressed with its interoperability with other applications, and we support the Open Source idea because we'd like to consider ourselves part of a collaborative community," says Stephen Sireci, Director of the Center for Educational Assessment at UMass. "In addition, TAO's QTI compliance allows us to create engaging and interactive items and easily export them to our existing test delivery system, which is very important."

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– STEPHEN SIRECI
Director of the Center for
Educational Assessment at UMass

IMPLEMENTATION

"Our item developers found it a bit of a struggle to move out of a multiple-choice mental structure at first," says Alejandra Garcia, Research Fellow and Doctoral Candidate in Educational Research and Psychometric Methods at UMass, who spearheads the TAO pilot. "But as far as the TAO technology itself, it was very easy for the entire team to pick up how to create the item interactions and build them into an item. We've progressed according to schedule, from learning the TAO interactions, to creating items, building the test, and actually piloting what we created this spring."

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– ALEJANDRA GARCIA
Research Fellow and Doctoral Candidate in Educational
Research and Psychometric Methods at UMass

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RESULTS

A Successful Pilot Program

A set of UMass-developed reading and math items that passed all internal reviews were approved for the pilot. These items are representative of the curriculum in two ways.

First, they measure skills in a more authentic way. For example, if the curriculum framework in reading called for students to be able to look at written information and convert it into visual information, a multiple-choice interaction wouldn't be ideal. But now with TAO, UMass can leverage the Graphic Gap Match interaction to much more accurately assess the skills required in this scenario.

Second, as the students' computer literacy levels vary, the TAO pilot items are used to verify the extent to which the ABE learners are able to interact with the technology.

"About 80 students across multiple test centers have taken mini tests composed of TAO items. For the pilot, we primarily wanted to experiment with a wide variety of interaction types, not create a large volume of items per se," says Ms. Garcia.

The pilot, along with associated focus groups, produced a range of positive findings, including:

- The UMass team was able to develop items to measure some of the math and reading skills that cannot be adequately assessed with multiple-choice questions.
- Because the test is administered in numerous facilities across the state of Massachusetts, the technology at each site can be vastly different. However, since TAO is a web application based on

HTML5 and responsive design, the TAO test display is visually appealing across the full range of devices, consistently. This supports usability needs and ensures student engagement.

- The TAO platform is quick and responsive, which enables the UMass team to make changes that are immediately available. "When I worked with test delivery providers in the past, changes could often take weeks," says Ms. Garcia. "However, because TAO is an online assessment platform, and we're the ones running everything from the backend, changes can be immediate. I really like the degree of control TAO gives us."
- The TAO team was readily available to provide fast and effective customer support.

The ultimate goal for the UMass team is to fully integrate TAO's item authoring module with their existing delivery platform, once they determine the range of items and interactions that they have developed are suitable for the ABE student population. Over the course of the 12-month pilot, the UMass team has collaborated with Open Assessment Technologies to improve TAO's overall usability and influence the product roadmap. The UMass team intends to continue the relationship, integrate the newly-developed TAO items into MAPT, and further expand their assessment offerings.

ABOUT TAO

Redefining Digital Assessment: Open Source, Open Standards, Open Possibilities. TAO, from Open Assessment Technologies, is the leading assessment solution for education and career advancement. Break free from proprietary data silos, eliminate expensive licensing fees, gain full control of your testing resources, and enjoy enterprise level support. Learn more at taotesting.com.

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