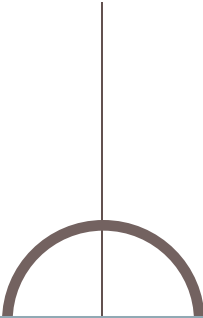# An
Open Source
Platform
for Internet-based
Assessment

A Report on
Education Leaders'
Perceptions
of Online Testing
in an Open Source
Environment

A Grunwald Associates LLC Report

Sponsored by
Educational Testing Service

Contents

Introduction

This report offers a window into the attitudes and experiences of state and national education leaders regarding internet-based testing and the potential for an open source platform to deliver such assessment.

Based on a study conducted by Grunwald Associates LLC and Education Development Center, Inc. (EDC), with support from Educational Testing Service (ETS), the report synthesizes the findings from over 80 interviews with state assessment and technology leaders (representing 27 states) and national education opinion leaders (representing both public and private organizations).

These in-depth conversations probed participants' beliefs, backgrounds, observations, and practices concerning internet-based assessment, as well as their knowledge of and experience with open source platforms. They yielded thoughtful and informative insights into the current state of high-stakes testing delivery and also provide some guideposts for education stakeholders seeking to move both summative and formative assessment forward in this country.

One clear finding of this study reinforces a common assumption: online delivery for state assessments will be the growing norm over the next five years. Assessment and/or technology leaders in 23 out of the 27 participating states indicated that their state is currently, or soon will be, offering state assessments online. State decision-makers cited important advantages of internet-based testing that include the freedom from logistical problems associated with paper-based tests, as well as educators' and students' strong preference for online testing once they have experienced it. National opinion leaders echoed this approbation, pointing in particular to online advantages of quick data turnaround and customizable reporting.

While the extent of online test offerings vary from state to state (from pilots to full-blown implementations) the forecasts of and the attitudes expressed by state assessment and technology leaders point solidly to a not-so-distant future where state tests will be increasingly offered via internet-based delivery.

The study found that **the vast majority of education leaders shared a strong interest in learning more about how an open source platform would operate in the context of state accountability testing.** Even as the study discovered that there were knowledge gaps among some educators about the exact nature of open source, there was nonetheless real interest in perceived cost-savings benefits of an online open source-based assessment platform, its adaptability potential, and the promise for collaboration and support among key stakeholders, including districts, states, educational organizations, and major testing publishers.

This report from Grunwald Associates LLC will examine some of the study's key findings in the following areas:

- Perceptions of online assessment
- Interest in an open source platform for online assessment
- Collaboration on an online open source platform

In addition, this report will provide case studies on what two states are already doing with online and open source-based assessment as well as offer some observations about what the overall findings may mean.

About the Study

Semi-structured phone interviews were conducted with a total of 81 education stakeholders, representing state assessment and technology leaders and national opinion leaders. Researchers at the Education Development Center, Inc. (EDC), in conjunction with Grunwald Associates LLC, used similar but slightly differing protocols between the two groups that probed respondents' thoughts about and experiences with open source internet-based testing.

For the state leader survey, 24 state assessment leaders and 19 state educational technology leaders from 27 states were interviewed. The participating states were a purposive sample, chosen for having initiatives in assessment (both generally and online) and a variety of areas in educational technology (e.g., one-to-one computer initiative, use of open source, infrastructure). For each state in the sample, whenever possible, both the assessment director and the educational technology director were interviewed; when this was not an option, researchers interviewed other knowledgeable personnel. For some states, only a single leader agreed to participate. Respondents were categorized, based on the information they shared in their interviews, by state experience level with online testing, as follows:

- Those from states with widespread online administration of annual accountability assessments.
- Those from states that have experimented with online testing, with limited participation.
- Those from states with limited or no experience yet with online testing.

For the opinion leader survey, 38 opinion leaders from public and private educational organizations were chosen, based on their influence nationally and/or regionally and their connections with assessment and educational technology. The types of organizations included in this study were categorized into four groups: (1) associations, coalitions, and foundations; (2) state and national policy organizations; (3) businesses and non-profits active in education issues; and (4) universities and research organizations.

Whenever possible, the directors of the selected organizations were interviewed; when this was not an option, researchers interviewed as senior personnel as were available in the time frame of the study. Specific titles of our study participants included: President, Vice President, CEO, COO, Executive Director, Associate Executive Director, Assistant Executive Director, Vice President, Senior Manager, Program Director, Board Member, Lead, Consultant, and Professor.

State leaders, with the exception of one participant, were not told about support of the study by Educational Testing Service (ETS) before responding to interview questions; almost all of the national opinion leader participants were not informed of ETS's involvement in the study prior to questioning. Furthermore, participants were guaranteed complete anonymity, again in an effort to encourage them to be forthright about their opinions and experiences. Except in the Utah and Virginia case studies, all participant quotes in this public report are unattributed, nor do they reveal any personal details about the speaker (including gender; all speakers are referred to as "he"), or specific details about the state or organization.

About Grunwald Associates LLC

Grunwald Associates LLC produces highly respected research on technology/media use by educators, students and parents. Grunwald is a full-service research and consulting firm offering an in-depth understanding of education technology, combined with mastery of state-of-the-art research methodologies.

Grunwald specializes in challenging assignments and works with nonprofit, corporate and government clients. Services include both quantitative and qualitative research focusing on technology use and attitudes, social marketing, messaging, branding, pricing simulations and product configuration.

Grunwald's reputation for research integrity and creativity has garnered the trust of key national education associations, policy makers, and educators around the country. More information is available at *http://www.grunwald.com.* «

Perceptions of Online Assessment

Interviews with assessment and technology directors from over half of the U.S. states point to an unmistakable trend: the move toward delivering high-stakes tests via the internet is accelerating.

The majority of states participating in the study (23 out of 27) were reported by their assessment and/or technology directors to be already offering online testing in some form (from content-area pilots to near-ubiquitous implementations) or they were reported to be moving their tests to the internet within the next five years. What's more, according to respondents, the online delivery of state-administered exams appears to be not only a growing trend, but a welcome one too.

Benefits of Online Assessment

In sharing their experiences with and attitudes towards online testing, most state leaders (and their national opinion leader counterparts) agreed on several key benefits.

- **Logistical improvements:** If the main reason for state migration to online testing could be summed up in one word, it would be: logistics. There is no doubt among state officials that online delivery represents a huge step forward over paper-based testing when it comes to the headaches attached to the statewide administration of high-stakes tests. One state official described the advantages of online testing this way: "[It] takes fewer people lugging boxes and moving equipment. [Before] online testing, we would have tractor-trailer trucks back up to a school district warehouse and unload boxes of materials."

   Securing the contents of tractor-trailer trucks—"a million and a half test booklets and answer documents circulating around 600 districts at a time"—was a formidable task, commented another state assessment director, adding: "I would like to see us get out of the business of printing and shipping test materials."

- **Better data:** The benefits of online delivery of high-stakes tests go well beyond operational, study participants attested, and can be seen in areas that directly or indirectly impact educational

Ongoing Challenges

All this is not to say that implementation of internet-based assessment has no challenges. Below is a discussion of the most common concerns expressed by assessment and technology leaders in states with experience in online testing.

- **Infrastructure:** Adequate infrastructure was the most common concern mentioned by state officials. The infrastructure issues cited included sufficient and secure bandwidth; the number of computers in a school available for testing; the location and set-up of school computers; the age and reliability of equipment; and the connectivity of the schools themselves. Some state leaders noted that they have been able to address these issues (see "5 Strategies for Online Success," p. 6), but acknowledged that infrastructure is an ongoing challenge as increased use and more complex operations require additional bandwidth and hardware upgrades.

- **District-level expertise and support:** Related to infrastructure, the need for technological expertise in and support for districts that administer online testing ranks high among state officials with experience in online assessment. Almost all of these state leaders mentioned the crucial role of technological expertise within the district. "Few people understand how really challenging it is at the local level," said one assessment director. Another

Benefits

quality. Assessment and technology directors from states that have implemented online testing reported that the online collection of data has introduced less error—for example, enabling states to better integrate test results with student demographic data—and has led to more efficient use of school administrators' time.

The data is not just more error-free—it's more useful, said respondents. For example, online assessment environments lend themselves to adaptive testing (in which tests dynamically adapt to the test-taker's ability or performance level), which provides schools with more precise estimates for scores at either end of the spectrum, according to one state assessment officer.

- **Quick turnaround of data:** National opinion leaders participating in the study were particularly enthusiastic about the benefits of the quick data turnaround that online delivery enables. One leader of a national educational organization pointed out that in a paper-based environment "the turnaround time for getting [results], especially in the high-stakes tests, can be several months. The kids are out in summer camp! And it really doesn't do anything for instruction."

  Echoing that sentiment, another national organization director observed that the "immediate feedback" available through online testing "helps schools and districts to look at their data and be able to respond to their students' needs without the lapse in reporting time."

- **Student preference:** One of the study's more interesting findings was that students' transition to internet-based assessment has not led to degradation in test performance. This is perhaps a surprising finding, given the commonly held belief in the education community that

Challenges

state assessment leader talked about the impact at the state level when things go wrong at a district: "[School personnel] may come in at six that morning, find out that their network went down overnight, and wonder what to do. Then the phone starts ringing at the state. The communication during testing is something we didn't expect, but now we realize that the phones get hot very quickly."

- **Complex test items:** In states that conducted pilots of more complex online assessments, officials spoke highly of the assessments themselves and of the positive reception from teachers and students, but noted that they encountered more technical and infrastructure challenges than expected when trying to do widespread or statewide implementations of these tests. One assessment leader who had difficulties scaling up online assessments using constructed-response items said that he had observed similar problems in other states: "Everyone I've met who says, 'Yes [statewide online testing] works like a charm, answers 'no' when I ask if their tests include constructed response."

- **Testing schedules:** Statewide implementations of internet-based assessment can mean rethinking a state's testing schedule, participants said. Testing windows need to be widened so as to not stress bandwidth with too much simultaneous traffic. As one state ed tech leader asked, "What happens when every tenth grader presses the enter key at the same time?"

  When asked to discuss the problems that they have encountered when implementing online testing, it's interesting to note what issue was not top-of-mind for state leaders: online security. To be sure, state officials were unanimous in naming security as a non-negotiable attribute of

Benefits

there are differences between online and paper-based test performance. But the states in this study that do widespread online testing reported little difference in performance, which leaders acknowledged could in part be accounted for by the fact that states must conduct comparability analyses when first moving a test online, which essentially limits them to offering online tests that are virtually the same as the paper tests. State leaders also suggested that minimal differences in performance may be due to the fact that students are both comfortable and engaged with the tests—not only because they enjoy the online medium ("kids love it" is how one assessment official put it), but also because they too appreciate the faster reporting of results, which makes their testing experience "more immediately relevant" to their learning.

- **Educator preference:** Students aren't the only converts to online testing. State officials reported that once districts try internet-based assessment, which sometimes takes a bit of encouragement, they do not want to return to paper and pencil testing. "The analogy that we've used," said one state ed tech leader, is that moving to online assessment "was like pushing the districts off a cliff—but they found out it was a four-inch drop! I'm aware of no school in our state that has done online testing and wants to go back to paper—once they've tried it, they're sold." In a related finding, leaders in states that piloted online assessments with more complex item types (e.g., lab simulations) reported that educators were very enthusiastic about the benefits from these more sophisticated testing instruments. «

Challenges

any online system they would consider. (As one interviewee put it, "Anything that would risk failure is unacceptable.") But in their discussions about the challenges they faced in administering exams online, the issue of online security did not rise to the level of the other challenges mentioned above. Make no mistake—security is a gating item for states when it comes to choosing and implementing an online assessment system. But given the generalized fears about security that online transactions can give way to, it's interesting to see that more quotidian issues like infrastructure, support, and scheduling are what occupy state administrators' time and minds.

Overall, states that have implemented internet-based assessment did not report any significant downside that would cause them to change direction. One assessment director, quoting district-level personnel after they first experience online testing, also could have been speaking for fellow state leaders when he said: "This is terrific. We need to do more of this!" «

5 Strategies for Online Success

State officials experienced with internet-based assessments offered the following strategies to ensure successful implementations:

Start small: Stagger implementation of online assessments—gradually adding more subjects and grade levels—as districts and schools build their infrastructure and gain local expertise. Some states said that they gradually grew their online system by having districts join voluntarily, adding schools as educators saw the success of other districts.

Start simple: Begin with multiple choice test items before venturing on to more complex items or open-ended assessments like writing.

Relax: Testing windows, that is. To manage the stress levels on bandwidth, some states have opened up the requirements for when regular state accountability tests must be administered. (These same states acknowledge the potential problem with this approach: districts may wait to the last possible minute to administer the test, to take advantage of longer prep time.) Some states shared that once online and paper versions of tests have been equated, they have allowed districts to take them at any time to match course completion or graduation requirements (e.g., high school end-of-course exams), which has served as an incentive to some districts to move to online testing.

Collaborate: Online testing requires the expertise of both assessment and technology experts, and the states that reported the most success with their online initiatives also reported strong working relationships among these expert groups. Some states have even reorganized to have assessment, technology, curriculum and instruction reporting into one office. Though collaboration is vital, it is not necessarily an easy process. "When we first started doing online assessments," reported one assessment director, "it was a surprise for the state that sharing responsibility with the IT side of the house was so uncomfortable. Having to share control of the process with other folks has been a challenge."

Ensure: As testing platforms grow, successful states have ensured their evolutions include multiple redundancies, checks, and safeguards to prevent data loss or corruption or negative user experiences. This requires, advised an experienced ed tech leader, "solid QA documentation, solid load testing information, such as system capacity, system architecture, timelines for software and new feature development—all the things that go along with software development regardless of who owns it."

Case Study

Virginia: Start Small, Grow Big

The state of Virginia is frequently pointed to as a pioneer in online assessment. Virginia began using internet-based testing in the 2000-01 school year, with about 15 of 132 school districts trying the online version. Ensuing growth of the program happened primarily through word of mouth, according to a spokesperson from the Virginia Department of Education (VDOE). "We built a solid base of divisions that had success initially and then it grew from there."

Virginia used a phased-in approach, start-

> "... states seeking to implement online assessment need people at the state assessment level who are knowledgeable about technology, who know the right questions to ask, and who can determine whether a decision is good for the state."

ing with three subjects at the end-of-course level. The state now delivers online over 95 percent of its end-of-course tests in mathematics, reading, history, and science. The state also administers online tests in grades 3 through 8 in the same subjects, which constituted an overall total of about 1.8 million tests online last spring. "We had a very good administration this spring. We were very happy," the spokesperson said.

Things weren't always so easy. In the beginning, a lack of computers in the schools was an issue. The computer labs were being used for up to three assessments a day, which meant that they couldn't be used for instruction. Some school divisions were even asking to test on

Saturday. Gradually the school divisions have brought on more computers, especially laptops and carts, which have helped with the problem of lab monopolization.

Virginia officials emphasize that states seeking to implement online assessment need people at the state assessment level who are knowledgeable about technology, who know the right questions to ask, and who can determine whether a decision is good for the state. VDOE staff also stress that the traditional divisions between assessment and technology departments disappear in successful implementations of online assessment. "It really became clear that there were not separate technology issues and separate assessment issues," the spokesperson commented. "If you have one you have the other."

Virginia believes that it was the right move to start simple and move the paper-based multiple-choice test over to online and then test its viability. "It gave us a chance to get to the volumes and the level of success that we've had," the spokesperson explained. The VDOE feels they've proven online testing and that they have buy in from their school districts. The questions they are asking now include: "What's next?" and "How can we start to really use what's available in technology to make our assessments better?'"

As it looks to the future, Virginia is starting to develop a new assessment with innovative item types for mathematics, and as existing content standards are revised, Virginia plans to include more innovative assessments. ≪

Interest in an Open Source Platform For Online Assessment

A key objective of the study was to ascertain education leaders' level of interest in an open source internet-based assessment platform, and the study found that the majority of participants expressed considerable interest in the idea. At the same time, many participants indicated they lacked information about and, in some cases, a well-developed understanding of open source platforms. Even so, participants' knowledge gaps about open source did not dim interest in such a platform delivering internet-based testing, and they were able to identify and discuss real issues associated with open source.

Knowledge of Open Source

"Open source" has many different connotations, and any movement toward an open source platform should take care to prepare participants with a base of common understanding (see "What Is Open Source?", p. 10). Opinion and state leaders alike freely admitted that their experience with and knowledge of open source was limited. Some state officials pointed to the district level as the place in their states where open source expertise resides, commenting that districts' use was generally unsupported by the state (not because of disapproval but a lack of internal expertise and resources at the state). A few state leaders drew particular attention to the fact that some of their districts use open source tools to build online formative assessments (see Utah case study, p. 11).

Benefits of Open Source

Even as participants were not completely knowledgeable about open source, the great majority of respondents knew enough to point out identifiable benefits associated with the platform in the context of internet-based assessment. Those benefits include:

- **Cost savings:** Both groups of survey participants overwhelmingly named cost savings as the primary potential benefit of open source. Among state leaders, cost savings was the most common immediate response when asked to name a benefit of open source ("no annual licenses, no renewals," as one state ed tech leader put it). National opinion leaders were equally positive about the cost benefits of open source, with 22 out of 38 respondents giving potential cost savings a 4 or 5 interest rating (5 being the highest). However, many of these opinion leaders also noted that they were interested in seeing an overall cost-benefit analysis about open source, as they hadn't done a study themselves (see "Concerns About Open Source" in the next column).

Concerns About Open Source

Just as study participants could identify clear benefits to an open source internet-based assessment platform, so too could they point out concerns, which were shared across state leader and national opinion leader groups and focused around two broad issues.

- **Hidden costs:** Education leaders may see great cost benefits in open source, but they do not equate open source with free. Respondents in both groups talked about the idea that any savings in licensing fees and the like would be balanced by the need for greater investments in maintenance, support, and ongoing development. Particular concerns about the need for and costs of professional development (for state-level staff) and technical support (at the local level) were expressed by state leaders. National opinion leaders were of the same mind. As one director of a national educational organization described the issue: "Any illusion that there aren't a lot of costs associated with maintaining and adapting and implementing an open source piece would be wrong." National

Benefits

- **Common development standards:** Several state respondents volunteered this attribute without prompting, citing the ability to have a standard item interchange format as a potential benefit to moving to open source. Such standardization, they said, might facilitate greater sharing of items across tests and across states (as appropriate), improving the ability of the states to integrate their assessment and data systems. One assessment leader talked about the current technical problems inherent in sharing test item banks and opined that an open source platform would improve upon the efficiency, cost, and distribution of sharing items. "This [will become] increasingly important as we move towards common core standards and national assessments," the leader added.

- **Adaptability:** Study participants showed strong interest in the potential of an open source internet-based assessment platform to be adaptable (i.e., to offer different kinds of tests—high stakes, formative, diagnostic—as well as different item types, on the same platform). Almost half of the national opinion leaders and a majority of the state leaders said that adaptability would be of "interest" or "high interest" to the people in their states. Technology directors (as compared to assessment directors) were especially articulate about what they saw as the adaptability benefits of an open source platform, as typified by one ed tech director who spoke of the "synergy around continuous improvement" he associated with open source. «

Concerns

opinion leaders were particularly concerned that open source requires a depth of resources that may not be available at the state level.

- **Security:** Rightly or wrongly, many study participants associated, or feared that others may associate, "open source" with "not secure." Comments on this issue abounded, and not just from assessment leaders, who might be expected to have a less sophisticated understanding of open source issues. One ed tech leader from a state that has experimented with online assessment said: "Open source. It just sounds insecure. It sounds like it isn't going to last for long. It doesn't sound real." Another state ed tech director questioned the safeness of the platform: "Because it's open source, the code they develop will be released back to the open source community, right? So that people can see, share it, and build on it. By exposing the code, does it create security issues? I don't know the answer to that."

  A director of a national policy group also acknowledged that "there's always been this perception that because it is open source, that opens up the code to security risks," a sentiment echoed by a leader of a national educational organization who said that there are fears that "open source means you're open and transparent. I suspect there's a level of scrutiny and security that's going to be challenging to do in terms of open source high-stakes testing." «

There's little question that education leaders are interested in the potential of an open source platform for delivering internet-based assessment. But the extent of their interest and the concerns associated with their interest may be related to their assessment priorities and their perceptions (whether accurate or not) of the benefits and problems of using an open source platform. For many of the national education opinion leaders, who were quite vocal in their desire for the country to move toward a more "open" system of assessment (that is, what they would see as a just-in-time diagnostic approach), the "openness" in open source intrigued them. For state assessment and technology leaders, whose main priority is administering high-stakes standardized tests, the "openness" in open source conjured up fears of security breaches (in a way that online testing probably still does for those who have not experienced it).

And while virtually all participants from both groups clearly agreed on the plus/minus aspects of the costs of open source (a potential to save on purchase and licensing fees, yet an acknowledgement of potential hidden costs of support and ongoing development), there was less certainty about the feasibility of perhaps the most salient characteristic of open source computing—peer-based collaboration—which we explore in the next section of this report.

What Is Open Source?

"Open source" software is developed by a community of like-minded peers for free distribution. Users of the software must sign a license agreement but then have free access to the source code in order to improve and implement an application.

The simplest definition for open source may come from Dan Woods, the author of Open Source and the Enterprise, who writes:

> Open source began as, and for the most part still is, software created by a community of people who are dedicated to working together in a highly collaborative and evolutionary way.

The advantages to a peer-community to use an open source approach to software development is that the community can determine the features and functions of the solution based on its needs, rather than be dependent upon the dictates of the commercial marketplace. In addition, the community can continually update and improve it based on user experience. To the extent that the community shares content, standards and the like, an open source platform can enable these kinds of exchanges as well.

But open source is by no means the same thing as "free" and neither does it preclude the involvement of companies who may charge for their ancillary services, which can include warranting the software, hosting the solution, or providing other kinds of support (technical, training, and so forth). For example, Red Hat Software "sells" Linux open source operating software, but what the company is really selling is its added value of a warranty and technical support, which offers customers the security of being backed by the company and its support infrastructure.

Open source as a concept has moved beyond software to other domains such as open content and curriculum. For the purposes of this study, the term open source is referring exclusively to an open source technology platform for the delivery of online assessments. But whether it is software, curriculum, or content, the key value proposition of open source is that there is an organized community around maintaining, improving, and extending the product.

Case Study

Utah's Open Source Formative Assessment Initiative

There was a chorus of study participants (mostly from among the national opinion leaders but also from state leaders) who voiced strong interest in an open source internet-based assessment platform that would support a more formative, diagnostic approach to testing.

The just-in-time capabilities of online coupled with the adaptability of an open source platform seemed, to many of these leaders, an irresistible opportunity to "personalize learning" and "change the classroom experience" by enabling the integration of dynamic assessment data into daily instruction. In fact, many of the opinion leader participants seemed more comfortable with initial use of an open source platform for formative assessment versus for summative tests, where the stakes attached to outcomes are much higher.

The state of Utah has been using an online open source platform for formative testing for many years now, spurred on by two separate but complementary driving forces: a desire on the part of classroom teachers to create practice tests for state accountability testing, and the state department's objective to support a research-based formative assessment approach at the district level.

Julie Quinn is the computer-based assessment specialist in the assessment section of the Utah State Office of Education (USOE), and manager of the five-year-old program called UTIPS (Utah Test Item Pool Service). She explains that teachers were looking for ways to better prepare their students for the Criterion Reference Tests (CRTs) that Utah had had in place for many years, as well as the NCLB accountability testing that came into play in the early 2000s.

The use of an open source platform was not by design, but by chance, explains Quinn. "It was a convenient partnership that already existed."

The teachers, most of them in rural districts, had turned for assistance in creating their practice tests to a group of technology specialists who were in the districts, under the aegis of the USOE, to provide technical support to these underserved areas. These particular technology consultants had already been working with an online open source learning management system, which they adapted to create an application wherein teachers could enter their own test items into an online interface that would then generate practice tests for their students.

Meanwhile, the state was "really motivated by the Black and Wiliam research," says Quinn, referring to the seminal 1998 study "Inside the Black Box: Raising Standards Through Classroom Assessment" by Paul Black and Dylan Wiliam, which presents evidence that classroom-based formative assessment, properly implemented, is a powerful means to improve student learning.

So the state department secured funding from a federal grant in the amount of $695,000 to take the online open source practice-test system that teachers were using and turn it into something that was scalable, more in line philosophically with the principles of formative assessment, and over which the state could exert quality control. "The state really wanted to improve the quality of a state-sanctioned item pool," Quinn explains. "We wanted to be able to say that these questions have been reviewed by our content and assessment specialists. They are aligned to the curriculum. These are appropriate kinds of questions."

The state may have stepped in to control quality, but they kept their teacher developers as part of the system. The USOE conducts a three-day professional development workshop on how to create appropriate formative test items for the UTIPS test bank; the state pays for substitutes to cover teachers who attend, or if they are not under contract, the teachers are paid $100/day. «

Collaboration in an Online Open Source Testing Platform

Any software solution built with open source code is dependent upon a community of like-minded users to create it, support it, and improve it. Study participants fully understood the role that collaboration would need to play in the development and ongoing support of an open source internet-based assessment platform. What they were less sure about was how that collaboration would play out across states and education communities.

Benefits of Collaboration

Some state leaders, especially those who are already members of NECAP (New England Common Assessment Program) were very positive about the potential for inter-state collaboration on assessment platforms. "We believe in the benefits of cross-state collaborations," said one member. "Not only monetarily, but in terms of building a better product." But even leaders without direct experience in inter-state assessment coalitions could identify some clear advantages that might arise out of such collaborations.

- **Sharing test items and standards:** As noted earlier, some state leaders see open source as a way to ease the way for sharing test items (as appropriate) by providing a mechanism and process for doing so. About a quarter of state-level participants, evenly split between assessment and technology officials, indicated that the potential for shared standards, as through the Common Core State Standards Initiative, could facilitate greater sharing of items and assessments across states, as well as create a standardized testing platform. One state ed tech leader spoke positively about cross-state collaboration and the creation of common standards leading to a "plug and play" common testing platform.

- **Sharing resources:** Several participants pointed out that one of the opportunities of collaborating on a cross-state open source online testing initiative would be the ability to

Challenges With Collaboration

Even as participants identified the advantages of state-to-state collaboration in an open source initiative, many also expressed concern or even skepticism about the feasibility of such relationships. Concerns centered around certain common themes.

- **Negative past experiences with collaboration:** Several participants mentioned multi-state collaborations on assessments that had not led anywhere. Others talked about negative experiences in other kinds of state collaborative initiatives, as exemplified by a director of a national educational organization who said that his organization, in doing such a project, came to believe that "states aren't designed to collaborate."

- **The need for alignment among partners:** Some participants commented on their lack of interest in working with partners who were not aligned with their way of thinking about assessment. A technology director from a state that does widespread online testing talked about how "competing priorities" of collaborative partners can lead to an inadequate product for all parties. Some said they require even more than philosophical alignment. A technology leader from a state that has limited experience with online assessment said, "I don't think my state would join any [others to] deliver a test that is not based on my state's framework."

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"leverage limited resources." As one ed tech leader from a state that has experimented with online testing said, "That's where we need to go as a nation. We need to leverage all the resources that we have, the key experts."

- **Sharing risks:** Most participants acknowledged that, in fact, they couldn't imagine embarking on an open source development project without the participation and support of other states. As one state director said: "It's a scary time to try something new" and would need what he called "peer pressure" to even consider it. Another ed tech director from a state with limited experience in online testing went even further to say that: "I think there would be extreme resistance in this state going to open source [unless we were] going with a consortium of other states." ≪

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- **Inefficiencies in the process:** Some participants pointed out that collaboration is not the most efficient form of production, as exemplified by a director of a national educational organization who worried about the "damage done by the downside" of collaboration, which he characterized as "fumbling and amateurishness."

- **The need for leadership:** Many participants saw the need for a defined organization or entity to lead the collaborative process, particularly in the world of high-stakes testing. "Sometimes it's hard to know who the definitive responsible party is," one assessment director said about the collaborative process. "There has to be a kind of lead to meet the needs of large-scale testing." A director of a national education organization suggested that "there would be a need for a third-party organization to lead the charge in some fashion." This person mentioned, as did other participants, examples that included the Council of Chief State School Officers (CCSSO) and the National Governors' Association (NGA) as possible lead organizations. ≪

The Role of Vendors in Open Source Collaboration

A recurring theme among respondents in discussing collaboratives and coalitions was that most respondents perceived testing companies as potentially valuable participants in an open source effort. Even as open source is often associated with "independence from vendors," when asked directly about it, neither state leaders nor national opinion leaders thought of independence from test companies as necessarily a positive outcome. Most participants expressed interest in having the involvement of knowledgeable companies in the development and support of online open source assessment platform.

State leaders were asked to specifically share their level of interest in an open source internet-based assessment solution if a major (unnamed) testing publisher moved its online platform to open source. That idea was very intriguing to more than half of state leaders, with technology directors more likely to express stronger interest than their assessment counterparts. It was also more intriguing to leaders from states with limited or no online testing than it was to leaders from states that are already heavily invested in online assessment with a particular vendor partner.

Overall, education leaders seem to view open source coalitions as a potential plus if there is the requisite leadership, and some see at least part of that leadership coming from testing publishers.

Observations

Synthesizing the study findings from the two different groups of participants—(1) state-level technology and/or assessment directors and (2) national opinion leaders—yields several observations summarized below.

People need to be informed: The study revealed that education leaders do not yet have a strong enough knowledge base about open source for them to make a truly informed decision about an open source platform for internet-based testing. Addressing, in particular, the issues of hidden costs and security are critical if stakeholders are to move forward with an open source platform.

Level of interest may be related to the current level of investment. Although the study data doesn't address this explicitly, we infer that states' interest in an open source platform for online assessment may depend upon how much they already have invested in a current platform. For those states that already have widespread implementation of online testing, it may be a hard business decision to walk away from their current system (unless, of course, their testing publisher partner joins the open source initiative). Among states that have not already invested a good deal of time and money into an online assessment solution, open source advocates may find greater interest in the idea—especially if it would cost the state less (even calculating the so-called hidden costs) than pursuing a proprietary platform.

Money is important, but it's not everything. Quality is ultimately more important than cash when it comes to state testing. The cost savings that can accompany an open source platform will not, in and of themselves, sell educators on this approach. Issues like security, support, expertise, and quality of product are—in the end—far more important to educators than cost.

It's hard to be first. Everyone has interest in moving forward but it's not easy to be the head of the pack. Before states are willing to make any kind of commitment to an open source platform, they want to be sure that others will stand with them, which will require strong coalition building.

Everyone wants structure and organization in their coalition. Collaboration is a plus/minus issue in educators' minds. On the one hand, most educators see its value in leveraging scarce resources and best practices. On the other hand, educators also know that coalitions can be messy and worry that potential competing interests of coalition partners could be counterproductive. Education leaders will need to see examples of open source communities that were able to successfully work together to create complex, high-stakes products that met the needs of all the members of the community.

Complex test items might be a way in: The states that have done widespread implementation of online testing couldn't be happier—except that they wish they could go beyond multiple-choice test items as they ramp up their exams for widespread use. National opinion leaders are highly supportive of online just-in-time diagnostic assessment that can inform instruction, which will likely require testing instruments that also go beyond multiple choice. It may be that an open source consensus can be formed around the need for complex online assessments, with the goal of delivering such tests via lightweight applications that can be offered statewide with manageable stress on bandwidth, infrastructure, and users.

Leadership is key. Perhaps the clearest inference that can be made from this study is that educators will look for leadership, structure, and organization if they are to take part in an open source initiative. All of the above issues—the need to protect current investments, the hesitation about being first, the need for productive collaboration, a complete understanding costs and risks— can be addressed by leadership that understands states' needs around assessment as well as how to leverage the organizational benefits (and manage the politics) of collaboration. This leadership could come from an existing organization or—more likely—a coalition of organizations. With such leadership, educators would likely be willing to put their concerns aside to take an honest look at an open source approach to online assessment.

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