

# PREPARING FOR ONLINE ASSESSMENT: CHALLENGES AND OPPORTUNITIES

*MASSACHUSETTS EDUCATIONAL TECHNOLOGY ADVISORY COUNCIL  
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## INTRODUCTION

It is no secret—or surprise—that technology is playing an increasingly important role in K-12 education. Across Massachusetts, and throughout the country, school districts are exploring how best to implement, maintain, and maximize the educational value of everything from legacy applications to cloud services, from desktop PCs to tablets. The rates and forms of adoption vary dramatically from district to district, as resources, school cultures, and other factors influence technology's place in the list of priorities.

The Partnership for Assessment of Readiness for College and Careers (PARCC) has recently detailed its plans to develop online formative and summative assessments for use by participating states, including Massachusetts, by 2014-2015. Massachusetts itself has also begun piloting online MEPA testing. In theory, such online assessments offer opportunities to improve education, not only at the state level, but at the individual classroom, school, and district level. Capitalizing on these opportunities, however, requires a sea change in culture amongst teachers, administrators, and school committees. Educators must internalize the idea of using online formative assessments to improve and customize student learning throughout the school year. School committees have to treat the infrastructure, equipment, and staffing that supports the use of educational technology and assessment data as core operational expenses, not as add-ons or luxuries. And administrators must realign school resources, from classroom facilities to professional development plans, to facilitate the use of technology and data as drivers of educational progress.

For those schools and districts that have embraced this cultural shift, but especially for those that have not, the move towards pervasive online assessment raises questions about how to prepare for this new form of testing. These questions take on additional urgency because districts on average follow a five year lifecycle for refreshing technology equipment. This means that the technology that school districts purchase today will likely still be in use when the PARCC assessments become available in three to four years.

This white paper by the Educational Technology Advisory Council (ETAC) addresses some of the many challenges that districts in Massachusetts face in fulfilling the needs of large scale online assessment. It also makes recommendations for guidance and support that the Board and Department of Elementary and Secondary Education could provide to districts to help address these challenges.

# CHALLENGES

## HARDWARE

The first, and perhaps most obvious, challenge facing districts is the availability of computers and other hardware for students to use when taking these online assessments. This is a multifaceted problem driven by both technical and financial questions, including:

- How many students will be expected to take online assessments simultaneously?
- What kinds of devices will be necessary for taking the online assessments? Could students use iPads, for example? Are physical keyboards required, or is a touchscreen sufficient?
- Are there minimum hardware requirements to run the necessary testing software (or web browser, plug-ins, etc.)?
- To what extent do districts have to plan for excess capacity in case of devices failing during the assessment?
- Do school buildings have sufficient electrical capacity, in total and specifically in locations where testing will take place, to power all the devices?
- What assistive technology will be required to ensure all students are able to complete the assessments?
- How can school districts that are already financially strapped afford to purchase, maintain, and refresh new devices to ensure that the equipment is available for testing?

## SOFTWARE

The prospect of online assessment also raises questions about the software choices districts make:

- Will online assessments require special software? If so, what operating systems are supported and what are the minimum requirements? Are there any known compatibility issues with other software that districts may be using?
- Are the online assessments web-based? If so, which browsers are supported? Are any particular plug-ins required?
- Are there restrictions on which other software students should be able to access while testing is in progress? Are there tools available to help ensure a locked-down testing environment, if needed?
- Will districts be expected to purchase licenses for any required software, or will this be provided by PARCC or the Commonwealth?

## NETWORK

In contrast to traditional computer-based assessment, online assessment requires sufficient, reliable Internet bandwidth. School districts will therefore have to know how much bandwidth is required by the online assessments and figure out how to procure the bandwidth, manage and monitor its usage, and filter online access in compliance with the Children's Internet Protection Act

(CIPA). Because even reliable Internet connections sometimes fail, districts will also need to know what provisions are in place if testing is disrupted.

## SECURITY

With a new form of testing comes new security challenges. It will no longer be sufficient to secure only the physical assets of tests and answer sheets. Now districts will have to prioritize the security of the devices from which students will take the exams. A keylogger on a computer could, for example, allow someone to pipe questions and a student's answers to a remote location in real time. Districts will also be concerned about student authentication (i.e., ensuring the student who shows up is actually the one logged in to take the exam) and network security (e.g., ensuring that a student doesn't create the electronic equivalent of pulling a fire alarm during test periods by unleashing a virus or congesting the network to prevent the test machines from communicating.)

## TECHNICAL EXPERTISE

It has always been important for districts to ensure that personnel proctoring exams are aware of proper procedure. With new technology in place, it also becomes necessary for such personnel to be familiar with the relevant software and how to troubleshoot common technical issues.

Furthermore, districts will have to ensure that key IT staff, such as support professionals and network administrators, are available during test taking windows, to ensure that technical problems do not derail the exams.

Students, too, will have to be exposed to the testing environment in advance of taking exams in a new format. Beyond familiarity with the testing system, there is some evidence—and an even greater perception—that students who lack basic familiarity and comfort with computing systems may underperform their peers when testing is delivered online. In some cases, especially with younger students or recent immigrants from less developed countries, students may lack the most basic skills needed to interact with a computer: typing, mouse use, etc.

## TESTING ENVIRONMENT

It has never been easy to test large numbers of students at one time. Districts have to dedicate time, space, and personnel to the effort. Testing spaces have to be laid out to minimize the potential for cheating, while proctors must monitor student behavior closely for the same reason. A change from paper exams to computerized exams introduces new challenges. How does a proctor monitor students' computer use to ensure they are not using a web browser or other software to search for answers to questions or communicate with other students? How do schools prevent one student from seeing another's answers on an adjacent screen? What happens if a student's computer or network connection fails in the middle of an exam?

# RECOMMENDATIONS

## GUIDANCE

It is expected that districts will be able to address the challenges above through planning, experience, and a commitment of necessary resources. That said, there are a number of areas in which guidance from the DESE can reduce the time, effort, and money required to do so. Clear guidance, especially in the case of anticipated mandatory testing, can also ensure that districts prioritize resources to prepare for the upcoming requirements. By providing key information in advance, and by collecting and distributing best practices and case studies, ETAC believes that the DESE can serve as a valuable resource to districts in preparing themselves for online assessment. Below are some examples of areas in which guidance will be helpful.

### *SYSTEM REQUIREMENTS*

As indicated earlier, it is essential that districts have accurate, unchanging information about system requirements for online assessment systems far in advance of implementation. DESE can play a valuable role in working with its partners, including PARCC and its own online test vendors, to ensure these requirements are clear, complete, and certain, and by distributing this information to districts in a timely manner. Such information must include supported hardware, operating systems, web browsers or other software applications, network environments, and necessary bandwidth.

DESE can also play a role in advocating that mandated or recommended assessment systems support a broad range of devices and platforms, including mobile devices. This will ensure that districts that have already invested in such devices, or that are considering such an investment to take advantage of the many educational and economic advantages offered by mobile platforms, will be able to use the devices to support student assessment.

### *LESSONS LEARNED*

Both within and outside of education, online assessment has been used before. School districts, state departments of education, and entire industries have learned lessons and developed successful models for providing broad access to secure testing environments. DESE can study these efforts and produce best practices and case studies about how challenges like those above have been addressed in other areas.

### *TECHNOLOGY PLANNING*

Local control in Massachusetts ensures many opportunities for innovation and experimentation. It also means that each district is left on its own to determine its technology needs and plans. It is the experience of the ETAC that districts routinely struggle to assess their needs and establish plans every few years. It is therefore our recommendation that the DESE provide guidance to districts on how to effectively engage in technology planning. Such guidance might include:

- questions to ask when assessing technology needs.
- a template for a written technology plan.
- recommended steps to take during the planning, purchasing, and implantation processes.
- examples of how other districts have saved money by investing in technology.

- sample hardware/software/network configurations that are likely to meet common needs.

## RESOURCES

While guidance from DESE will help streamline efforts of districts to prepare for and sustain environments conducive to online assessment, resources are certain to be an ongoing challenge, especially in certain districts. Below are two recommendations for areas in which the DESE can help alleviate the burden.

### *BROADBAND ACCESS*

Internet bandwidth is an increasingly critical resource for districts preparing students for 21<sup>st</sup> century college and career opportunities. For some districts, sufficient bandwidth to meet student and teacher needs—including for online assessment—may not be available, or may be available only at high cost. This is especially true in rural areas, but even urban districts may be limited to one or two expensive commercial providers. ETAC recommends that the DESE work with other state agencies, broadband vendors, and other stakeholders to ensure the availability and affordability of Internet bandwidth to districts throughout the Commonwealth.

### *STATE PURCHASING*

Districts already have access to certain vendors and discounts through existing state contracts. It is the ETAC's opinion, however, that the DESE can do more to identify and negotiate affordable technology product and service opportunities for districts. This opportunity arises because many of the technology needs from district to district are the same or similar. By working with vendors to offer certain bundles of hardware and software and/or commonly requested services at lower prices, and by ensuring districts are aware of these offers, the DESE can help districts streamline both their planning and their purchasing.

DESE can also play a role in facilitating conversations between district personnel and vendors. Such conversations can help make vendors aware of the anticipated future needs of districts to help guide their product roadmaps. Similarly, district personnel can learn about products and services that are envisioned for the future by vendors, aiding the districts in planning effectively.

### *DIRECT FUNDING*

For many districts, the interventions recommended so far may be insufficient to meet the expectations implied by mandatory online assessment and the myriad educational needs of their students. The ETAC recommends, therefore, that ESE look to states like Virginia and Maine for inspiration on how the Commonwealth can help raise and provide to districts the necessary funding and support needed to address the capital investment challenges described above.

## CONCLUSION

The ETAC is excited about the educational opportunities that online assessment offers to Massachusetts students. We also recognize the many challenges that districts face as they try to prepare for a shift to using online assessments at scale. The ETAC hopes that by providing this

overview of the challenges, and a few recommendations for how the DESE can help address them, the DESE will be better prepared to drive positive change in how online assessments and other technology is used to support educational improvement throughout the Commonwealth.

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