Thank you. I appreciate your service to children in Maryland.

I am a parent of children who attend Baltimore County Public Schools. I am a physician, and a scientist, and I believe there is a role for technology in education, and technology is clearly helpful for students with specific learning differences.

I understand that MSDE will be updating Maryland's technology plan, using the National Educational Technology Plan which was released in December as a guide. I come to you with serious concerns about the NETP.

### 1. Research.

First, while the NETP plan is incredibly enthusiastic about the potential for technology to solve educational problems, it even says in the introduction: "Research on the effectiveness of technology-enabled programs and resources is still limited."

However, the report then goes on to have 21 recommendations – and not a single recommendation calls for high-quality, unbiased research.

This is not acceptable. Our children must not be subject to experiments that are not being rigorously, fairly evaluated, and that ignore outcomes that matter to parents, teachers and students.

### 2. Opportunity Costs

Given that the NETP points out there is no research to support its vision of technology integration, you might expect that there would be some acknowledgment of the complex trade-offs school districts must make in order to fund such programs with scarce resources. How should a school district balance spending funds on a personalized learning 1:1 initiative – costing hundreds of millions – against smaller class sizes, more bus drivers, community schools that holistically support families of hungry children? The topic is ignored.

### 3. Conflict of Interest

I am shocked by that when you look at the list of people who were chosen to participate in the creation of this report, almost every person involved has real ties to the for-profit educational technology industry.

Additionally, the NETP does not make a single mention of how conflict of interest must be managed by states and local districts making decisions about their scarce resources as they pursue ed-tech initiatives. In the interest of time, I'll leave you with a letter to the editor.

### 4. Health

The report makes no mention of the potential health outcomes of widespread use of technology in schools. Baltimore County is embarking on a K-12 1:1 initiative which puts kids on tablets for hours per day during school and for homework. Schools need to be thinking about vision, eye strain, ergonomics, fine motor control, the effects of gamification on brain development, and social and emotional development, among others. "Games" and "gaming" are mentioned 82 times in a 100 page report.

5. **Testing**

I've brought some articles about the PARCC on computer vs. on paper—the fact that it is harder on the computer does not make sense as a justification for all-digital testing environments.

http://www.edweek.org/ew/articles/2016/02/03/parcc-scores-lower-on-computer.html

http://news.schoolsdo.org/2016/02/parcc-scores-lower-on-computer-than-on-paper/

The passage of ESEA is being hailed as rolling back high-stakes testing. What is far less obvious about the ESEA is that for-profit educational technology firms have a smooth road to continually testing students anytime, anywhere, through competency-based, or proficiency-based education. With the push for competency-based testing and technology intertwined, education will move away from human teachers. This is no better, and in my view, is even worse, and it also exposes our children to far more time every day on technology, with no solid research supporting effectiveness.

One of my children is by an online competency based education program now, and it is awful. This is in a subject previously beloved by my child. I welcome any opportunity to share with you what this is actually like, and encourage you to hear from parents, students and teachers before making any decisions.

6. **Privacy**

The NETP report does discuss privacy, but you should know that most parents do not actually support their children's data being shared with for profit companies for research and ultimately marketing purposes.

## Conclusion:

In closing, as I mentioned, "games" and "gaming" are mentioned 82 times in a 100 page report. It is as if the developers of the NETP believe that children do not enjoy learning and need to be cajoled and entertained to get them to learn. I am here to say that as a parent and avid learner, I believe the desire to learn is innate in people, especially children. I want my children to have the opportunity to learn without the influence of unfounded machine learning and the pressure of financing ed tech companies. We know small class sizes work in educating children; we need to focus on the whole child, and their humanity.

MSDE should be very critical and thoughtful in its appraisal of the NETP plan. Without checks and balances, for- profit companies can make money based on shoddy research and deceptive marketing, and it is our children across the state who will suffer. I ask that you focus on thoughtful objectivity as you update Maryland's technology plan.

Thank you.

Cynthia M. Boyd, MD MPH

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Cell 410 258 6432

**REFERENCES AND LINKS**

**NETP 2016:**

http://tech.ed.gov/files/2015/12/NETP16.pdf

**Research:**

Much of the data that is available to support personalized learning comes from for profit companies or non-profits that are funded by corporate interests. The leading voices in American Education do NOT support this type of initiative.

The Organization for Economic Cooperation and Development report on Students, Computers and Learning states that it is beneficial when children spend up to ½ hour per day on a device at school, more than that is more likely to be harmful than helpful. You don't need your own 1:1 device for this amount of time – you can share. Further, *"technology is of little help in bridging the skills divide between advantaged and disadvantaged students,"* so schools may in fact be harming children instead of addressing equity by diverting attention and resources away from more effective strategies.

*"The results also show no appreciable improvements in student achievement in reading, mathematics or science in the countries that had invested heavily in ICT (information and communication technology) for education. And perhaps the most disappointing finding of the report is that technology is of little help in bridging the skills divide between advantaged and disadvantaged students. Put simply, ensuring that every child attains a baseline level of proficiency in reading and mathematics seems to do more to create equal opportunities in a digital world than can be achieved by expanding or subsidising access to high-tech devices and services."*
http://www.oecd-ilibrary.org/education/students-computers-and-learning_9789264239555-en

Baltimore County Public Schools now cites a study by Pane et al. as justification for claiming that personalized learning is beneficial. The report by Pane et al. was published in November 2015; and 90% of the schools were charter schools.

https://www.bcps.org/academics/stat/STAT-Eval_FAQ.pdf
http://www.rand.org/content/dam/rand/pubs/research_reports/RR1300/RR1365/RAND_RR1365.pdf

In fact, the National Education Policy Center, based at the University of Colorado, wrote a detailed critique of the Pane study, showing that it is impossible to use this study as a valid justification for Baltimore County Public Schools' S.T.A.T. initiative.

*"Broad conclusions about the efficacy of technology-based personalized learning, however, are not warranted by the research. Limitations include a sample of treatment schools that is unrepresentative of the general population of schools, the lack of a threshold in the study for what qualified as implementing "personalized learning" in the treatment schools, and the reality that disruptive strategies such as competency-based progression, which require the largest departures from current practice, were rarely implemented in the studied schools."*
http://nepc.colorado.edu/thinktank/review-personalized-learning

Diane Ravitch, a nationally and internationally respected educator at New York University, recently wrote:

*"The Baltimore County Public Schools are embarking on a risky gamble that will put all students online. At present, there is no research base to prove the value of this expensive venture. What we can predict is two nefarious consequences: 1) the computers will be used for "embedded assessment," so that students are tested daily or continually without knowing it. Second, the students will be data mined continually, and their personally identifiable information will be available to third parties or subject to hacking."*

http://dianeravitch.net/2016/01/28/teacher-baltimores-risky-expensive-bet-on-technology/


## Opportunity Costs:

*"Class size is an important determinant of student outcomes, and one that can be directly determined by policy. All else being equal, increasing class sizes will harm student outcomes.*

*The evidence suggests that increasing class size will harm not only children's test scores in the short run, but also their long-run human capital formation. Money saved today by increasing class sizes will result in more substantial social and educational costs in the future.*

*The payoff from class-size reduction is greater for low-income and minority children, while any increases in class size will likely be most harmful to these populations.*

*Policymakers should carefully weigh the efficacy of class-size policy against other potential uses of funds. While lower class size has a demonstrable cost, it may prove the more cost-effective policy overall."*

http://nepc.colorado.edu/files/pb_-_class_size.pdf

https://www.washingtonpost.com/news/answer-sheet/wp/2014/02/24/class-size-matters-a-lot-research-shows/

http://www.classsizematters.org/research-and-links/

http://www.theatlantic.com/education/archive/2015/11/quantifying-classroom-tech-market/414244/


## Conflict of Interest:

http://www.baltimoresun.com/news/opinion/oped/bs-ed-grasmick-0117-20160116-story.html

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http://www.tomorrow.org/speakup/advisoryCouncil/council.html

http://www.tomorrow.org/speakup/2015_ClassroomModels.html   Scroll to the bottom for a list of some of the funders of the survey this year.

http://schedule.sxswedu.com/events/event_PP51878

http://www.dreambox.com/video/principals-perspective

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http://www.bcps.org/news/articles/article7967.html

http://www.bcps.org/news/articles/article7983.html

http://educationfoundationbcps.org/news/2014/11/bcps-leadership-in-advancing-technology-wins-national-digital-innovation-in-learning-award/

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https://www.youtube.com/watch?v=UlgiAwvVnf8

http://www.baltimoresun.com/news/opinion/oped/bs-ed-dance-technology-20151201-story.html

http://www.pearsoned.com/events-and-webinars/cite

http://www.ed.gov/news/press-releases/us-department-education-releases-2016-national-education-technology-plan

## Health:

### Social and Emotional outcomes:

"*UCLA scientists found that sixth-graders who went five days without even glancing at a smartphone, television or other digital screen did substantially better at reading human emotions than sixth-graders from the same school who continued to spend hours each day looking at their electronic devices.*

*'Many people are looking at the benefits of digital media in education, and not many are looking at the costs,' said Patricia Greenfield, a distinguished professor of psychology in the UCLA College and senior author of the study. 'Decreased sensitivity to emotional cues — losing the ability to understand the emotions of other people — is one of the costs. The displacement of in-person social interaction by screen interaction seems to be reducing social skills.'*"

http://newsroom.ucla.edu/releases/in-our-digital-world-are-young-people-losing-the-ability-to-read-emotions

Uhls et al. Computers in Human Behavior, Volume 39, October 2014, Pages 387–39, available at http://www.sciencedirect.com/science/article/pii/S0747563214003227

Human Interaction is vital for learning.

*"There's simply no evidence that a young child can learn language directly from a toy. It isn't responsive enough. It isn't social."*
http://www.npr.org/sections/ed/2016/01/11/462264537/the-trouble-with-talking-toys

Sosa A. JAMA Pediatr. Published online December 23, 2015. doi:10.1001/jamapediatrics.2015.3753  available at http://archpedi.jamanetwork.com/article.aspx?articleid=2478386

http://well.blogs.nytimes.com/2015/12/23/traditional-toys-may-beat-gadgets-in-language-development/?_r=0

http://www.npr.org/2013/12/29/257922222/closing-the-word-gap-between-rich-and-poor

Gaming changes brain development.

*"The group examined the functional magnetic resonance imaging (fMRI) brain scans of 154 14 year old boys and girls. When they compared the brains of frequent gamers (defined as those who played video games more than 9 hours per week( to moderate gamers, they discovered that the first group showed larger volume in the left striatum, a brain area involved in risk and reward processing..... 'This could explain a potential mechanism that makes people play more,' says Kuhn. 'Even when facing losses, the reward center of the brain is activated – suggesting a potential mechanism for non-substance addictions.'*
http://www.dana.org/News/Details.aspx?id=43201

Kuhn et al. Translational Psychiatry (2011) 1, e53; doi:10.1038/tp.2011.53 , available at http://www.nature.com/tp/journal/v1/n11/full/tp201153a.html

Technology sometimes makes learning worse.

*"As technology allows people to do more tasks at the same time, the myth that we can multitask has never been stronger. But researchers say it's still a myth — and they have the data to prove it."*

http://www.npr.org/templates/story/story.php?storyId=95256794

*"As tested on a group of undergrads, the research proved that laptop users type almost everything they hear without processing the meaning or devoting much thought to what it is they're taking notes on. Basically, when you type, all you're doing is mindlessly transcribing, and that does not require much cognitive activity.  When you take notes by hand, however, you obviously can't write down every single word your professor utters. So you listen, summarize, and list only the key points. Your brain is more engaged in the process of comprehension and so the information processed this way is remembered better."*

http://www.lifehack.org/articles/productivity/heres-why-you-should-take-notes-hand-instead-with-laptop.html

*"Taking notes on laptops rather than in longhand is increasingly common. Many researchers have suggested that laptop note taking is less effective than longhand note taking for learning. Prior studies have primarily focused on students' capacity for multitasking and distraction when using laptops. The present research suggests that even when laptops are used solely to take notes, they may still be impairing learning because their use results in shallower processing. In three studies, we found that students who took notes on laptops performed worse on conceptual questions than students who took notes longhand. We show that whereas taking more notes can be beneficial, laptop note takers' tendency to transcribe lectures verbatim rather than processing information and reframing it in their own words is detrimental to learning."*

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http://ergo.human.cornell.edu/IEA2000/iesclassroomcomputers.pdf
http://ergo.human.cornell.edu/MBergo/schoolguide.html

From Harvard Medical School:

http://www.health.harvard.edu/pain/prevent-pain-from-computer-use

A study by Australian scientists about computer use in kids and neck pain:

http://www.iea.cc/ECEE/pdfs/art0211.pdf

From the McKinley Health Center, University of Illinois at Urbana-Champaign

http://www.mckinley.illinois.edu/Handouts/neck_pain/neck_pain.htm

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Privacy:

http://www.studentprivacymatters.org/are-most-parents-really-okay-with-educational-use-of-student-data/

News / Opinion / Readers Respond

# The bond between business and education

JANUARY 29, 2016, 2:54 PM

I n a recent commentary, former state schools superintendent Nancy Grasmick concludes that "our goal should be for the education community to work hand-in-hand with businesses to deliver 'personalized' learning opportunities" ("An inextricable bond between education, business," Jan. 15).

Yet to our dismay, the relationship between business and the public schools is lauded without a single mention of the policies and ethics that must underlie such "conversations" and "bonds."

A key issue is conflict of interest in the business-educational technology relationship: How much are our school leaders allowing themselves to be influenced by corporate concerns, particularly in the field of educational technology, rather than focusing on the needs of students, teachers and schools?

Consider an example from the field of medicine, where there is wide recognition of the unwarranted influence business interests can have. Influence by pharmaceutical companies makes it more likely for a physician to prescribe a medication manufactured by those companies. Consequently, both of our state's medical schools and policy-making organizations at the state and federal level have very strict rules about such interactions.

The issue in our public schools is not that different when one considers the increasingly cozy relationship between educational technology companies and school administrations. As technology proliferates in school settings, an increasing number of companies vie to gain influence over its use.

The primary motive of business is to make a profit; the primary goal of public education is to serve the public good.

This doesn't mean that business and education cannot work together. But in contrast to Ms. Grasmick's view, the ultimate purpose of education is not to further success in the global marketplace.

Education technology is big business; with the ed-tech market totaling more than $8 billion in 2012-2013 and investors flocking to the K-12 market, according to a recent article in the Atlantic. Ms. Grasmick argues that the use of "computers, the Internet and social media" should be at the forefront of education. Technology as a learning tool certainly has its place, but the positive and negative consequences of "using a wide array of technology to deliver academic content" have yet to be thoroughly researched, both in terms of educational and even health outcomes. The costs of such

programs should also be considered. For example, Baltimore County Public Schools is spending over $270 million on tablet-style computers and personalized learning, and the district is planning to spend $40 million on classroom projectors. The opportunity costs (a concept any supporter of business should understand) here are considerable; imagine what such money could buy in terms of smaller class sizes and safer school buildings.

Within the Baltimore County Public Schools system, the STAT (Students and Teachers Accessing Tomorrow) initiative is now pressing ahead with a 1-to-1 computer environment in elementary classrooms, with a focus on online educational programs and "personalized learning" to achieve the goals of which Ms. Grasmick writes. School administrators, whose official role is to educate 110,000 children, have been participating in speaking engagements, technology tradeshows, and even advisory committees that connect them closely with the very same companies contracting with their schools. They have received awards from technology organizations backed by those same technology companies. The annual BCPS State of the Schools program is also sponsored by companies with a financial interest in selling to the system; this includes the supplier of computers for the 1-to-1 program. Are we "hand-in-hand with business to deliver 'personalized' learning opportunities" or have we already crossed directly into conflict of interest?

Ethical boundaries are necessary in leadership, in both education and business, to maintain both objectivity and clarity of purpose. Breaking down such essential barriers by blurring the lines between the needs of the market and the purpose of education will shortchange our children.

Cynthia Boyd and Leslie Weber, Baltimore

**This article is related to:** Drugs and Medicines, Nancy Grasmick

News / Opinion / Readers Respond

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# PARCC Scores Lower On Computer Than On Paper

TOPICS:   PARCC   Testing

POSTED BY: PAUL KATULA   THURSDAY, FEBRUARY 4, 2016

**Voxitati** reported a year and a half ago that research showed taking notes on computer during lectures leads to lower retention rates for the knowledge gained in those lectures, and now the PARCC multistate testing consortium issued a report that claims students who took standardized tests in math and English during the 2014-15 school year on computer scored lower than their peers who took the tests using paper and pencil, *Education Week* reports.

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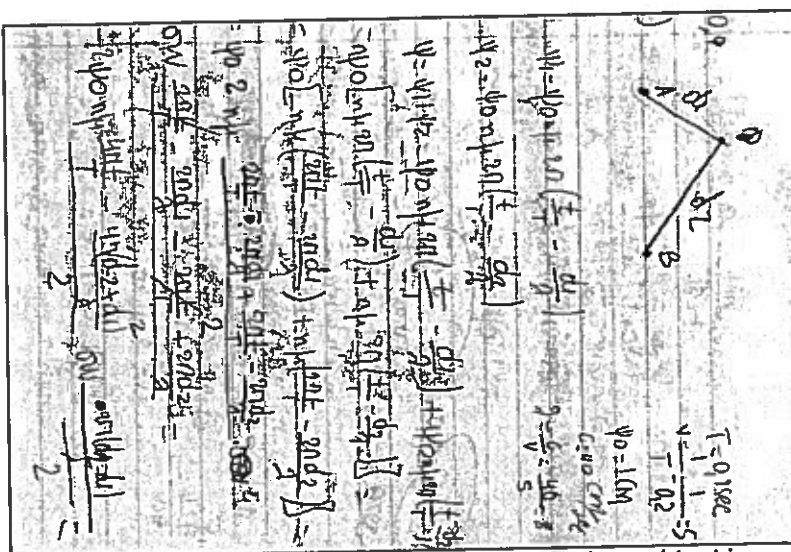
Most of our best students learn, write, teach, and test in mathematics by drawing pictures, working little side problems in the corner of their papers, etc., none of which is possible on the PARCC tests. This forces students into a foreign mode of expression that does not resemble their classroom instruction in (good) mathematics. Scores go down.

On average, students who took standardized tests developed by the Partnership for Assessment of Readiness for College and Careers, or PARCC, scored lower if they took the test on computer than if they took it using pencil and paper. But the differences weren't universal across all subgroups, schools, or states, PARCC noted.

"There is some evidence that, in part, the differences we're seeing may be explained by students' familiarity with the computer-delivery system," the education journal quoted Jeffrey Nellhaus, PARCC's chief of assessment, as saying.

Let's start with the inescapable fact that the delivery system forces students to express themselves about math in ways that don't in any way resemble math—even when computers and servers are functioning properly, which was not always the case—and then move to a

demonstration using a public-release PARCC math question.

The **instruction manual** for the equation editor, say, to type in a constructed response for a math question is flawed in that it neither fully explains the plethora of palettes students need to navigate nor assists students with the entry for most of the answers they'll be required to type in for the test, using a combination of math symbols and plain text. Any time a purported tool requires so many pages of instructions to say nothing, you know the tool itself is getting in the way of valid measurement.

"The differences are significant enough that it makes it hard to make meaningful comparisons between students and [schools] at some grade levels," the journal quoted Russell Brown, chief accountability and performance-management officer for Baltimore County Public Schools, as saying. "I think it draws into question the validity of the first year's results for PARCC."

Now let's move to that example I promised. Anecdotally, I can tell you that when I looked at student responses in high school math, I noticed, with my colleagues from other states, that students who entered answers online had a noticeable tendency to type less than those who took the tests using paper and pencil wrote.

**Using the public release questions from PARCC in algebra 1, let me now move to an actual demonstration of this phenomenon. Consider this problem, with a Part A that is**



SUNDAY, FEBRUARY 21, 2016

Movie review: *Race*



MONDAY, FEBRUARY 15, 2016

N.C. teacher wins GRAMMY Music educator award



SATURDAY, JANUARY 23, 2016

Movie review: *Caged No More*



WEDNESDAY, JANUARY 20, 2016

Show choir bus engulfed in flames



SUNDAY, JANUARY 17, 2016

Movie review: *Yellow Day*

**worth two points, one for the right answer and one for showing the work:**



Part A

Create a function that can be used to find the total amount of money the school earns by selling $x$ tickets. Show your work used to create this function.

First, I need to find the total expense of the prizes.
When added together,
$349 + 42 + 25 + 18 + 16 = 450$.
The total expense is $450.
I also know that 75 raffle tickets will pay for the expense.
$\frac{450}{75} = 6$. This means that one raffle ticket will cost $6.
The school will earn $6 per ticket, but will not really be earning money until they sell enough to cover the cost of the prizes. Therefore, the school's earnings can be expressed by the equation $y = 6x - 450$, where y is the earnings and x is the number of tickets sold.

PARCC algebra 1, public release question VF736473, PBA #12, "Amount School Earns"

**This student receives full credit in Part A. Not all of that work is required for full credit, but the student is required, according to the scoring rubric published for this question, to show correct "work to support the function." Now look at this one:**



Part A

Create a function that can be used to find the total amount of money the school earns by selling $x$ tickets. Show your work used to create this function.

$$f(x) = 6x - 450$$

Part B

The school's goal is to raise at least $850 more than the total cost of the prizes. What is the minimum number of raffle tickets

**The answer is correct, but because the student didn't show where the 450 or 6 came from, the student gets only partial credit, 1 point. Now, 450 isn't a number a student can just pull out of the air, so it could be argued that there's evidence to support the statement: "The second student performed the exact same mathematical operations as the first student."**

But not all of that work was shown or, more to the point, typed in. Maybe this student found the equation editor on the test-delivery system cumbersome and didn't want to waste time on a timed test to enter what he might have considered simple arithmetic. It's obvious to his teacher and any reasonable adult where the numbers came from.

It can also be argued that we need to train students how to use the tool so they can achieve full credit for the work they do. But that argument is a little off the mark: What we actually care about is that both students understand this particular learning standard in algebra 1 at about the same level but received different scores on the test. We really couldn't care less how well students are able to use some fabricated and contrived tech tool that they'll never need to know how to use in their entire lives after taking the PARCC test.

If these students had taken the test using paper and pencil, it's probably the case that the second student would have shown some scratch work in the corner of the page, which could be counted toward the score. But on computer, that work is not shown, so it can't just be "assumed" and counted toward the score, despite the fact that every reasonable adult knows the student didn't just pull 450 out of thin air.

## Longhand is better for learning as well as testing

Studies showing that it's better for learning to take notes using pencil and paper have been widely analyzed and extended, in publications as diverse as *Scientific American* and the *Harvard Business Review*. The original study, conducted by psychological scientists Pam Mueller of Princeton University and Daniel Oppenheimer of the University of California, Los Angeles, was published in the journal *Psychological Science*.

Their research "suggests that even when laptops are used solely to take notes, they may still be **impairing learning** because their use results in shallower processing," they wrote. "In three studies, we found that students who took notes on laptops performed worse on conceptual questions than students who took notes longhand. We show that whereas taking more notes can be beneficial, laptop note takers' tendency to transcribe lectures verbatim rather than processing information and reframing it in their own words is detrimental to learning."

# Online testing has its advantages

Perhaps the biggest advantage to online testing, compared to paper testing, is that the student responses themselves are more protected from teacher interference or mishaps during shipping. If a teacher wants to change a student's wrong answer to a right one, for instance, she will have to access the student's test online using a secure login and password. Tracking information will be available for investigators down the road, while investigating security violations using paper tests is much more difficult.

Cost is another advantage. Although scores are lower for students, states save money by using online testing, as a general rule: there's no expense to print or ship test booklets. However, these savings accrue to the state for the PARCC tests and are not noticed by individual schools. Unofficially, as in I don't have public records with the figure, Maryland saved more than $2 million because so many schools chose to give the **PARCC tests online** in 2014-15.

It's also easier, in general, to meet the needs of students with individualized education plans using computers. Screen colors can be adjusted, for example, if students are sensitive to high-contrast visual fields. Kids with motor deficiencies may be able to use an adapted keyboard.

In addition, it has been argued that online testing allows results from the tests to be delivered more quickly to teachers so that they can modify instruction, where needed, for individual students. Again, this expected benefit of online testing, while it exists with smaller, school-based tests, has not materialized on the PARCC tests.

Online testing also allows different question formats to be used in testing students' understanding, and a few of these question types can't be delivered on paper. An example would be an audio or video clip, a simulation of a science experiment, or a similar "technology-enabled" question.

# But not all tech enhancements are true enhancements

As with cost and time savings, the benefits of new-age question types have largely failed to materialize on the PARCC tests, although videos have been included on some English tests. Furthermore, technology often gets in the way instead of making the test more valid or reliable, especially in math, and may hinder students or frustrate them as they try to respond to a question in a way that's not available to them.

Consider the PARCC released question 15 for algebra 2, **here**. The student is required to use a tool to plot the graph of a quadratic function. Given students' limited knowledge of algebra, one student may want to draw a straight line or a cubic function on the coordinate axes provided.

These answers would be incorrect, but whereas a student taking the test on paper would be able to draw whatever graph he believed in his mind to be the correct answer, the online test-taker will be frustrated by the system that allows only a parabola to be drawn on the coordinate axes. No matter how hard he tries or how badly he wants to draw a straight line, the system will frustrate him without ceasing in this endeavor.

Not being able to enter an answer he may want to provide, the student may become frustrated, which could impair his ability to answer subsequent questions on the test correctly. This is worse than simply getting the one problem wrong and will result in a lower score for the

student who was frustrated by the limited options available to him using the online test-delivery system.

That is, even when computer systems are functioning properly and schools don't have to go to extraordinary lengths to schedule a school full of students into a computer lab with a limited number of computers over the lengthy testing window, other qualities of technology may make the tests invalid, unreliable, or unfair, despite the hoped-for benefit of being able to deliver accommodations to students with special needs.

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### ABOUT THE AUTHOR



### Paul Katula

Paul Katula is the executive editor of the Voxitatis Research Foundation, which publishes this blog. For more information, see the About page.

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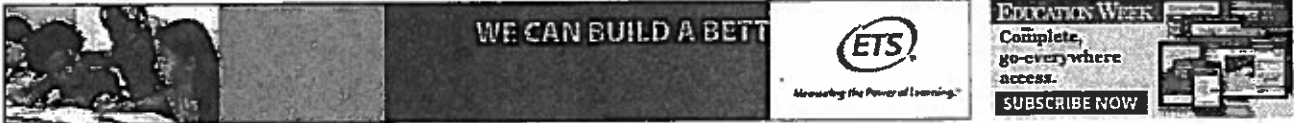
Published Online: February 3, 2016
Published In Print: February 10, 2016, as PARCC Scores Lower on Computer Exams

# PARCC Scores Lower for Students Who Took Exams on Computers
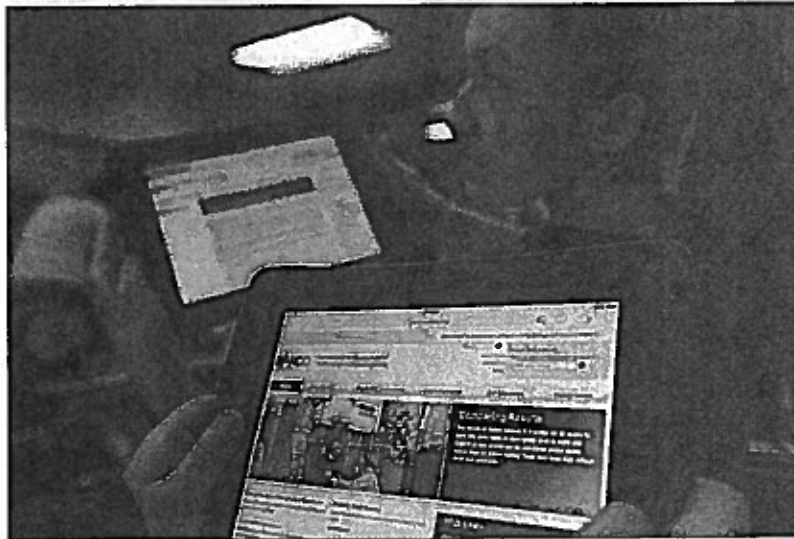


Seventh graders at Marshall Simonds Middle School in Burlington, Mass., look at a PARCC practice test to give them some familiarity with the format before field-testing in 2014 of the computer-based assessments aligned with the common core.
—Gretchen Ertl for Education Week-File

### Discrepancy Raises Questions About Fairness

By Benjamin Herold

Students who took the 2014-15 PARCC exams via computer tended to score lower than those who took the exams with paper and pencil—a revelation that prompts questions about the validity of the test results and poses potentially big problems for state and district leaders.

Officials from the multistate Partnership for Assessment of Readiness for College and Careers acknowledged the discrepancies in scores across different formats of its exams in response to questions from Education Week.

"It is true that this [pattern exists] on average, but that doesn't mean it occurred in every state, school, and district on every one of the tests," Jeffrey Nellhaus, PARCC's chief of assessment, said in an interview.

"There is some evidence that, in part, the [score] differences we're seeing may be explained by students' familiarity with the computer-delivery system," Nellhaus said.

In general, the pattern of lower scores for students who took PARCC exams by computer is the most pronounced in English/language arts and middle- and upper-grades math.

Hard numbers from across the consortium are not yet available. But the advantage for paper-and-pencil test-takers appears in some cases to be substantial, based on independent analyses conducted by one prominent PARCC state and a high-profile school district that administered the exams.

In December, the Illinois state board of education found that 43 percent of students there who took the PARCC English/language arts exam on paper scored proficient or above, compared with 36 percent of students who took the exam online. The state board has not sought to determine the cause of those score differences.

Meanwhile, in Maryland's 111,000-student Baltimore County schools, district officials found similar differences, then used statistical techniques to isolate the impact of the test format.

They found a strong "mode effect" in numerous grade-subject combinations: Baltimore County middle-grades students who took the paper-based version of the PARCC English/language arts exam, for example, scored almost 14 points higher than students who had equivalent demographic and academic backgrounds but took the computer-based test.



A student at Marshall Simonds Middle School in Burlington, Mass., reviews a question on a PARCC practice test before 2014 field-testing of the computer-based assessments.
—Gretchen Ertl for Education Week-File

"The differences are significant enough that it makes it hard to make meaningful comparisons between students and [schools] at some grade levels," said Russell Brown, the district's chief accountability and performance-management officer. "I think it draws into question the validity of the first year's results for PARCC."

### 4 of 5 PARCC Exams Taken Online

Last school year, roughly 5 million students across 10 states and the District of Columbia sat for the first official administration of the PARCC exams, which are intended to align with the Common Core State Standards. Nearly 81 percent of those students took the exams by computer.

Scores on the exams are meant to be used for federal and state accountability purposes, to make instructional decisions at the district and school levels, and, in some cases, as an eventual graduation requirement for students and an eventual evaluation measure for teachers and principals.

**Several states have since dropped all or part of the PARCC exams, which are being given again this year.**

PARCC officials are still working to determine the full scope and causes of last year's score discrepancies, which may partly result from demographic and academic differences between the students who took the tests on computers and those who took it on paper, rather than the testing format itself.

Assessment experts consulted by *Education Week* said the remedy for a "mode effect" is typically to adjust the scores of all students who took the exam in a particular format, to ensure that no student is disadvantaged by the mode of administration.

PARCC officials, however, said they are not considering such a solution. It will be up to district and state officials to determine the scope of any problem in their schools' test results, as well as what to do about it, Nellhaus said.

Such uncertainty is bound to create headaches for education leaders, said Michael D. Casserly, the executive director of the **Council of the Great City Schools**, which represents 67 of the country's largest urban school systems.

"The onus should be on PARCC to make people aware of what these effects are and what the guidelines are for state and local school districts to adjust their data," Casserly said.

**Comparing Online and Paper Tests a Longstanding Challenge**

The challenges associated with comparing scores across traditional and technology-based modes of test administration are not unique to PARCC.

The **Smarter Balanced Assessment Consortium**, for example, told *Education Week* that it is still investigating possible mode effects in the results from its 2014-15 tests, taken by roughly 6 million students in 18 states. That consortium—which, like PARCC, offers exams aligned with the common core—has yet to determine how many students took the SBAC exam online, although the proportion is expected to be significantly higher than in PARCC states.

Officials with Smarter Balanced are in the early stages of preparing technical reports on that and other matters.

"We'll analyze the operational data. I can't speculate in advance what that implies," Tony Alpert, the executive director of Smarter Balanced, said in an interview. "We don't believe that differences in scores, if there are any, will result in different decisions that [states and districts] might make based on the test."

States that administer their own standardized exams, meanwhile, have for years conducted comparability studies while making the transition from paper- to computer-based tests. Past studies in Minnesota, Oregon, Texas, and Utah, for example, have returned mixed results, generally showing either a slight advantage for students who take the tests with paper and pencil, or no statistically significant differences in scores based on mode of administration.

The National Center for Education Statistics, meanwhile, is studying similar dynamics as it moves the National Assessment of Educational Progress, or NAEP, **from paper to digital-administration platforms.**

An **NCES working paper released in December** found that high-performing 4th graders who took NAEP's computer-based pilot writing exam in 2012 scored "substantively higher on the computer" than similar students who had taken the exam on paper in 2010. Low- and middle-performing students did not similarly benefit from taking the exam on computers, raising concerns that computer-based exams might widen achievement gaps.

A still-in-process analysis of data from a study of **2015 NAEP pilot test items** (that were used only for research purposes) has also found some signs of a mode effect, the acting NCES commissioner, Peggy G. Carr, told *Education Week*.

"The differences we see across the distribution of students who got one format or another is minimal, but we do see some differences for some subgroups of students, by race or socioeconomic status," she said.

One key factor, according to Carr: students' prior exposure to and experience with computers.

"If you are a white male and I am a black female, and we both have familiarity with technology, we're going to do better [on digitally based assessment items] than our counterparts who don't," she said.

The NCES is conducting multiple years of pilot studies with digitally based items before making them live, in order to ensure that score results can be compared from year to year.

A PARCC spokesman said the consortium did analyze data from a 2014 field test of the exam to look for a possible mode effect, but only on an item-by-item basis, rather than by analyzing the exam taken as a whole. The analysis found no significant differences attributable to the mode of administration.

When asked why 2014-15 test scores were released to the public before a comprehensive analysis of possible mode effects was conducted, Nellhaus, PARCC's chief of assessment, said responsibility rests with the states in the consortium. "People were very anxious to see the results of the assessments, and the [state education] chiefs wanted to move forward with reporting them," Nellhaus said. "There was no definitive evidence at that point that any [score] differences were attributable to the platform."

### Illinois, Baltimore County Find Differences in PARCC Scores By Testing Format

The Illinois state school board made its PARCC results public in mid-December. In a press release, it made indirect mention of a possible mode effect, writing that the board "expects proficiency levels to increase as both students and teachers become more familiar with the higher standards and the test's technology."

A comparison of online and paper-and-pencil scores done by the state board's data-analysis division was also posted on the board's website, but does not appear to have been reported on publicly.

That analysis shows often-stark differences by testing format in the percentages of Illinois students who demonstrated proficiency (by scoring a 4 or 5) on PARCC English/language arts exams across all tested grades. Of the 107,067 high school students who took the test online, for example, 32 percent scored proficient. That's compared with 50 percent for the 17,726 high school students who took the paper version of the exam.

The differences by format are not so pronounced in elementary-grades math; in grades 3-5, in fact, slightly higher percentages of students scored proficient on the online version of the PARCC exam than on the paper version.

But proficiency rates among paper-and-pencil test-takers were 7 to 9 points higher on the 8th grade and high school math exams.

The Illinois board has not conducted any further analysis of the results to determine the cause of those discrepancies. Board officials declined to be interviewed.

"The statewide results in Illinois suggest some differences in performance between the online and paper administrations of the assessment," according to a statement provided by the board. "There is no consistent relationship from district to district. ... Both versions of the test provide reliable and valid information that teachers and parents can use to identify student strengths and areas needing improvement."

## PARCC 2014 - 2015
## Online vs. Pencil and Paper
## ELA Scores, Statewide Results in Illinois
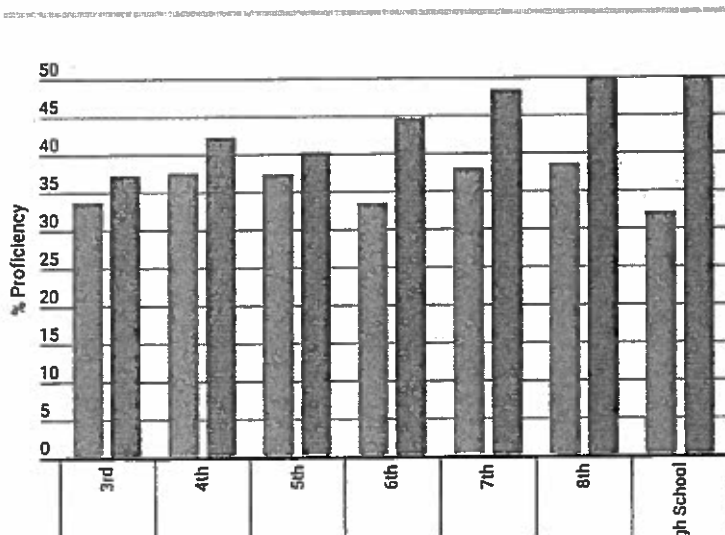
In Maryland, meanwhile, more than 41,000 Baltimore County students in grades 3-8 took the PARCC exams in 2014-15. Fifty-three percent of students took the math exam online, while 29 percent took the English/language arts exam online. The mode of test administration was decided on a school-by-school basis, based on the ratio of computers to students in each building's largest grade.

Like Illinois, Baltimore County found big score differences by mode of test administration. Among 7th graders, for example, the percentage of students scoring proficient on the ELA test was 35 points lower among those who took the test online than among those who took the test on paper.

To identify the cause of such discrepancies, district officials compared how students and schools with similar academic and demographic backgrounds did on each version of the exams.

They found that after controlling for student and school characteristics, students were between 3 percent and 9 percent more likely to score proficient on the paper-and-pencil version of the math exam, depending on their grade levels. Students were 11 percent to 14 percent more likely to score proficient on the paper version of the the ELA exam.

"It will make drawing comparisons within the first year's results difficult, and it will make drawing comparisons between the first- and second-year [PARCC results] difficult as well," said Brown, the accountability chief for the Baltimore County district.

"This really underscores the need to move forward" with the district's plan to move to an all-digital testing environment, he said.

### A Big 'Bug in the System'

In the meantime, what should state and district leaders, educators, and parents make of such differences?

The test results still have value, said Nellhaus of PARCC.

"This is still useful and important information providing a wealth of information for schools to improve instruction and identify students who need assistance or enrichment," he said.

But possible mode effects on multistate-consortia exams should be taken seriously, at least in the short term, and especially if they have not been accounted for before test results are reported publicly, said assessment experts consulted by *Education Week*.

"Because we're in a transition stage, where some kids are still taking paper-and-pencil tests, and some are taking them on computer, and there are still connections to high stakes and accountability, it's a big deal," said **Derek Briggs**, a professor of research and evaluation methodology at the University of Colorado at Boulder.

"In the short term, on policy grounds, you need to come up with an adjustment, so that if a [student] is taking a computer version of the test, it will never be held against [him or her]," said Briggs, who serves on the technical-advisory committees for both PARCC and Smarter Balanced.

Such a remedy is not on the table within PARCC, however.

"At this point, PARCC is not considering that," Nellhaus said. "This needs to be handled very locally. There is no one-size-fits-all remedy."

But putting that burden on states and school districts will likely have significant implications on the ground, said Casserly of the Council of the Great City Schools.

"I think it will heighten uncertainty, and maybe even encourage districts to hold back on how vigorously they apply the results to their decisionmaking," he said.

"One reason many people wanted to delay the use [of PARCC scores for accountability purposes] was to give everybody a chance to shake out the bugs in the system," Casserly added. "This is a big one."

*Associate Editor Catherine Gewertz contributed to this article.*

*Coverage of the implementation of college- and career-ready standards and the use of personalized learning is supported in part by a grant from the Bill & Melinda Gates Foundation. Education Week retains sole editorial control over the content of this coverage.*

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**homeschoolingmom**　　　　　　　　Score: 3　　　Report Abuse
7:32 AM on February 4, 2016

The PARCC website allowed anyone to take a sample test. When I, as an adult, took the computer test, it was FULL OF BUGS! One screen, nothing showed up when I typed, but when I was shown a summary at the end, every key stroke was recorded. Some questions had you pick from several options, whether your answer would be a whole number, mixed number, etc. There had to be the right number of boxes in the right order for you to input one number of your answer into each box! That was confusing. Some questions had multiple parts, but the 2nd and 3rd parts were not visible unless you scrolled down, and I missed answering some problems all together. When I got to the end, it told me to go back and review my answers, which I tried to do. I was able to fill in a couple of missed problems, but when I tried to correct that answer that recorded miscellaneous key strokes, I was locked out, my test was gone. I think BUGS made online scores LOWER!!

---

**Dr. Mark Roberts**　　　　　　　　Score: 5　　　Report Abuse
11:09 AM on February 4, 2016

I'm really surprised that it took this long for the brilliant education minds who created PARCC to realize that those students who took the PARCC on-line didn't score as well as those who didn't. As a former principal in a high ELL, high poverty, high refugee school, this was a concern from the beginning of the first announcement of the students taking the test on-line. The PARCC is difficult as a written test. Throw in computer competency, and the results cannot be valid based on the goals for the test. As a staff, we couldn't determine if PARCC was testing academic rigor and knowledge

or computer competency? We also couldn't ecide if it waas teaching both. We beleive the test results are skewed because we are not able to analyze the data with the assumption that all students are computer literate, because they are not. Therefore, the test results are inaccurate. If students with disablities are taking the on-line test, it is even more difficult to analyze data, especially if the student is a language learner with special needs. I can't believe the great minds are trying to analyze the results and scratch their heads as to what happened, especially when it is clearly obvious.

My advice is to get out of your offices, visit high poverty, high ELL and high refugee schools and really take a look at the hard work that goes into teaching language to students so they can be productive citizens instead of wondering what happened. I'm sure you'll have an eye opening experience and reconsider this testing mess. Remember, these students and families aren't going away.

---

**K12 Specialist**
11:09 AM on February 4, 2016

Score: 0    Report Abuse

What company is behind the technology to execute the online testing?

---

**Bruce William Smith**
11:53 AM on February 4, 2016

Score: 2    Report Abuse

As bad as this mode effect discrepancy is, it's only the third biggest problem with these tests. First is that the federal government needs to give up on this NCLB test-based accountability strategy for school improvement, which will never ensure that "every student succeeds". Next, the Common Core standards are not aligned to those that are needed to make our youth internationally competitive, especially in mathematics, and this matters since more and more foreign students are showing up on American shores, breezing through easy ACT and SAT mathematics sections, and taking seats in American universities that might have gone to Americans if our leaders hadn't opted to promote standards that, even if learned as intended, will leave too many American children struggling to work for international bosses whose children have been better educated.

---

**dr. c**
2:00 PM on February 4, 2016

Score: 1    Report Abuse

This highlights the problem that occurs when big testing companies lobby at the statehouse door for their platform. What's best for kids isn't even part of the discussion once the money starts to flow. Education professionals have been concerned about this issue for several years but those concerns fell on deaf ears. The solution is simple; go back to paper and pencil and make the companies responsible for assessing.

**Laurene@Metiri**                    Score: 0          Report Abuse
4:52 PM on February 4, 2016

I find this statement interesting: "raising concerns that
computer-based exams might widen achievement gaps." To
me, the achievement gap is the actual difference in what
students know, understand, and are able to do. That shouldn't
be impacted by test administration. If the format causes
scores to be lower or higher, that may make it appear the
achievement gap has widened, but in reality the scores may
be further apart but achievement would be exactly where it's
always been. I think it's important to remember the difference
between a test score and achievement.

↪ 1 reply

**Peter**                             Score: 3          Report Abuse
10:24 PM on February 4, 2016

Go look at the sample PARCC. The interface is a nightmare—
reading frames too small to read or write full texts, frames
within frames, and complicated clicking and dragging. It's an
absolute mess.

**USER_ICEM003069980**                Score: 0          Report Abuse
2:00 PM on February 5, 2016

Neither the paper nor the computer taker scores were over
50% proficiency. At those low numbers, why are we arguing
over which way to test? Seems like the energy should be spent
on helping students learn regardless of the means with which
they are tested. (I teach 97% FARM Middle School.) Worrying
about how to administer the tests masks the real issues.

**Dr. Tess**                          Score: 1          Report Abuse
6:11 AM on February 6, 2016

I think blended learning is a valuable means of delivering
instruction. However, I have always maintained that it is
difficult for many children to work off the computer. There
have been studies which show that students prefer paper
pencil over the computer. I completed online courses and
found that I had to print much of what I was reading. When I
wrote my dissertation, I did each section in longhand then
typed it into a Word Document. My mind responded better to
the paper pencil then to the touch of a keyboard. Students
should be able to show what they know in the way that is best
for them. For some this will be on the computer, for others it
will be paper pencil, and still for others it may be an orally
presentation.

**CRMCDONALD**                        Score: 0          Report Abuse
7:44 AM on February 6, 2016

What corp administers PARCC? From The Voice at
http://www.phillyvoice.com/concerns-rising-over-pearson/

Pearson, a London-based international publishing and education company which originally started in construction in 1844, has become a colossus in the U.S. education system. On every level of education, the company has a presence and a product to sell.

---

**Chellychelchel**
8:01 PM on February 17, 2016

Score: 0      Report Abuse

Not at all surprising! Online tests that they are not use to taking, rigorous questions when it is not how they are taught. We start with the student, when we need to ensure educators know how to use the technology and use various 'DOK's" in the classroom, THEN bring in the MULTIPLE assessments. errrrrrrrrr!!!!

---

**Chellychelchel**
8:07 PM on February 17, 2016

Score: 0      Report Abuse

Tell an adult they can no longer use hardcover books to read, and that they can only use a Kindle or their phone. Then tell them they have to read and test on information that is new to them...say non-fiction, and see what they say!

---

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February 23, 2016

Mr. Guffrie M. Smith, Jr., president
State Board of Education
200 West Baltimore Street
Baltimore, Maryland 21201

RE:     Clarification of Parents' Right to Opt Out and Students' Right to Refuse
        State Mandated Testing

maryland
state education
association

140 Main Street
Annapolis, MD 21401-2003
t 800·448·6782
f 410·263·3605
marylandeducators.org

BETTY H. WELLER
President
CHERYL BOST
Vice President
DAVID E. HELFMAN
Executive Director

Great Public Schools
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Dear Mr. Smith:

The 2016 PARCC testing window is fast approaching. As many parents remain
frustrated with the volume of standardized testing that their children must sit for,
it is predictable that there will be parental requests to opt their children out of
testing or, in some instances, students' refusing to take the test during the testing
window. As you know, Maryland does not have legislation or regulation
specifying an opt-out policy, which has led to confusion among parents who want
to know their options and among educators who lack guidance on what they can
and cannot share with parents asking about their options.

The State Board and MSDE have been discussing this issue for quite some time,
yet no notification or consistent message has been released or shared with
classroom teachers and principals across the state.
- October 28, 2014- Board exhibit from Dr. Lowery provides feedback prior
  to publishing COMAR 13A.03.04 Testing Administration and Data-
  Reporting Policies and Procedures. One such question and MSDE
  response, "Will COMAR address 'opting out' concern? MSDE is having
  discussion as to the best method of addressing this."
- December 8, 2015- Board exhibit "State Assessment Update-LEA
  Feedback" documents an issue regarding "Parent Opt-Out issues." MSDE
  action is primarily restricted to messaging on student privacy and data
  usage.

For these reasons, MSEA is calling on the State Board of Education to develop an
opt-out policy. This policy, which will be shared statewide, shall outline

alternatives that local boards may provide in the case of a student refusal or a parent desire to opt-out and that explains the impact of such a decision on the student, the school, and the system.

In the past, MSDE has taken the position that local school systems should advise parents that they have no right to opt their child out of testing as it is part of the curriculum and that parents cannot pick and choose what part of the public education program their child will participate. However the latter statement often is not borne out. For example, in many counties there are processes for parents to use to request that their child opt out of courses such as human sexuality or receive alternative instruction on different health topics. It is time for MSDE to address the growing anti-testing sentiment in a direct and forthright manner.

An opt-out policy would provide uniformity among the local boards in responding to parent requests to opt their child out of testing or a student's refusal to take the test. Basic questions such as whether local boards may provide alternative instruction and whether students should sit quietly in the testing room or in the library with alternative work or reading should be addressed by such a policy. Direction is necessary to ensure that student learning may continue, or instruction is reinforced in areas that are lacking for the student based upon their teacher's observations or other assessment data.

We do not believe the adoption of a policy on opt-out rights will result in widespread opt-out requests, nor would we want that result. Therefore, we are also suggesting that with any alternatives for continuing instruction, that MSDE develop an accompanying document explaining the impact of an opt-out decision on the student directly, the school, and the system. While the Every Student Succeeds Act (ESSA) maintained a 95 percent student participation rate in testing, it permits states flexibility in determining how this requirement is factored into the overall accountability system ($\S1111(c)(4)(E)$). As such, a state with a strong opt-out movement can minimize the participation rate requirement so that it has a negligible impact on school accountability systems. With this, any fear of not meeting federally mandated requirements and facing potential financial impact should be minimized. Certainly, we would anticipate that Maryland would

exercise its flexibility in this regard as opposed to adopting punitive measures such as those suggested by the US Department of Education in its December 2015 letter, including the denial of funding or the designation of non-participating students as non-proficient.

Only through ongoing efforts to reduce unnecessary or poor quality standardized tests will the anti-testing sentiment subside. Developing a well thought out opt-out policy would facilitate richer, more grounded discussions among administrators, educators, parents, and students about testing generally and the impacts of not participating, which currently cannot occur given MSDE's position that all students must be tested. Most importantly, however, a policy would also provide ready answers for school staff when parents or students refuse participation under any circumstances. It makes little sense to continue to tell frustrated parents that they have no rights when demanding to opt their child out of testing when this is not a universal standard for other aspects of public schooling.

MSEA stands ready to partner with you to develop an opt-out policy for local boards of education, administrators, teachers, parents, and students that is sensible, measured, and helps address the concerns of all stakeholders.

Sincerely,

Betty Weller
President


C:      Jack Smith, interim state superintendent
        Members of the State Board of Education

Good Morning. My name is Leslie Weber and I'm a long-time public school advocate from Baltimore County. My two children graduated from BCPS, I was a PTA President at two schools, and I co-founded the largest public education advocacy coalition in our county, Advocates for Baltimore County Schools or ABCSchools.

Because the METP will be updated using the NETP, I'd like to comment on problems with both plans and the related concepts of "personalized" or "blended" learning.*

The METP recommends a 3:1 student-to-computer ratio at the elementary school level. In BCPS, that ratio has been lowered to 1:1 through the $270-million K-12 S.T.A.T. Initiative.

To close achievement gaps, NETP focuses on Personalized Learning, which is anything but since very few actual persons are involved. Teachers are pushed to the side so children can "facilitate their own learning" or teach themselves on digital devices.

The needs of the whole child, in many cases a child desperate for more human interaction, not less, are ignored in this curriculum-delivery model, as is the role of the loving, nurturing teacher.

Removed from both plans, too, is the expertise of early-childhood educators. While there is a place in teaching for technology, no research from credible child-development experts indicates that technology is the best teacher. Despite the fact that the NETP supposedly builds on "the work of leading education researchers," not one child-development expert is cited in the references of NETP Section 1 on Learning. This is key because S.T.A.T. has rolled out in a number of elementary schools. As posted on the BCPS website**, no early-childhood education research is included in the citations of research aligned to S.T.A.T. Is digital learning even developmentally appropriate for our youngest learners?

Maslow's Hierarchy of Needs notes that when a child's most basic needs are not met, learning cannot occur. Our county has over half of its students living in poverty. We do not have enough social workers, guidance counselors, or pupil personnel workers to meet the needs of these at-risk children.

The NETP and METP speak of bridging the digital divide and closing achievement and equity gaps, but the true divide is socio-economic. Our economic infrastructure and social fabric have changed, leaving many behind. It's crucial to close gaps, but I believe technology is not the means to help our most vulnerable students.

Thank you.

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*Education Week: Technology in Education: An Overview (published 2/5/16)

http://www.edweek.org/ew/issues/technology-in-education/

"Perhaps the biggest hurdle confronting educators interested in blended learning, though, is the lack of a solid research base. As of now, there is still no definitive evidence that blended learning works (or doesn't.) While some studies have found encouraging results with specific programs or under certain circumstances, the question of whether blended learning positively impacts student learning still has a mostly unsatisfactory answer: 'It depends.'"

**Selected Research Aligned to BCPS S.T.A.T.

http://www.bcps.org/academics/stat/annotatedBibliography.html

# Poverty and Food Insecurity in Baltimore County Public Schools

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**About 53,000 children attending Baltimore County schools live in poverty.** This figure comes from the number of children receiving Free and Reduced Meals (FARM) in County schools, as reported to the Maryland State Department of Education in October of each year.

**\*Schools with 50% or More in Poverty:** In 4 Councilmanic Districts, the 1$^{st}$, 4$^{th}$, 6$^{th}$, and 7$^{th}$, **the majority of schools have over 50% of students in poverty:**

- 1st District (Tom Quirk):        **15 of 23** schools 50% or more students in poverty

- 2nd District: (Vicki Almond):    **8 of 20** schools 50% or more students in poverty

- 3rd District (Wade Kach):        **1 of 22** schools 50% or more students in poverty

- 4th District: (Julian Jones)     **18 of 20** schools 50% or more students in poverty

- 5th District: (David Marks)      **2 of 18** schools 50% or more students in poverty

- 6th District: (Cathy Bevins)     **18 of 23** schools 50% or more students in poverty

- 7th District: (Todd Crandell)    **26 of 31** schools 50% or more students in poverty

**Not the entire picture:**
According to The United Way of Central Maryland, in **Baltimore County, a self-sufficient income for a family of three (one adult, a preschooler and a school-aged child) is 335% of the poverty level ($19,790), or $66,296.**

- **In 2014, 83,682 children lived below 300% of the federal poverty level, or almost 48% of all children Baltimore County (total number below 18 was 175, 250).**

**Food Insecurity:**
In 2013, in Baltimore County **over 33,000 children struggled with food insecurity,** representing 18.7% of children in the County, and an increase from 31,190 in 2012. This is the second highest level in the state and slightly more than Baltimore City.

**Food insecurity and Hunger: Food Insecurity** is a household-level economic and social condition of limited or uncertain access to adequate food. **Hunger** is an individual-level physiological condition that may result from food insecurity.

**Consequences of hunger and household food insecurity for young children:**
Smaller brain size: Children in the lowest income brackets (study of over 1,000 children), had brains that were up to 6% smaller than children in higher income brackets.
- increased hospitalizations
- poor health, including iron deficiency and increased risk of developmental problems
- behavior problems, primarily aggression
- anxiety, fatigue, depression, and attention deficit disorder

**Household food insecurity in older children has also been associated with:**
- low scores on measures of health
- behavioral functioning
- academic performance

**Homeless students: In 2014-2015, there were 2,742 identified homeless children attending BCPS schools.** Homeless children are at high risk of hunger and food insecurity, especially on weekends, school breaks, and during the summer.

**10 County schools with highest numbers of homeless students**
**(2014-2015 data from BCPS, received 12-23-2015):**

1) Parkville High School          90
2) Dundalk High School          77
3) Patapsco High School          61
4) Deep Creek Middle School          58
5) Dundalk Elementary School          57
6) Kenwood High School          53
7) Shady Spring Elementary School  51
8) Catonsville High School          48
9) Deep Creek Elementary School          47
10) Woodlawn High School          45

**Forty-seven County schools have 20 or more homeless students,** including **Dulaney High School** (43), **Pleasant Plains Elementary School** (35), **Sussex Elementary School** (44), and **Perry Hall High School** (36).

**SUGGESTED GOALS**
1) Increase numbers of low-income children eating breakfast and lunch in schools, increase after-school and summer meal programs and access to them

2) **Increase funding at state level in the 2016 budget for Maryland Meals for Achievement (MMFA) in low income schools,** so that all children in eligible low-income schools can receive a free breakfast. Please call state legislators and urge them to increase the funding for MMFA so that all eligible schools can participate.
**http://md.nokidhungry.org/maryland-meals-achievement**

**DOCUMENTATION AVAILABLE UPON REQUEST**