

IMPROVING STUDENT LEARNING OUTCOMES IN 2017

ACCORDING TO THE LATEST ORGANIZATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD) PROGRAM FOR INTERNATIONAL STUDENT ASSESSMENT (PISA), THE U.S. PERFORMED AROUND AVERAGE IN **SCIENCE AND READING**, BUT BELOW AVERAGE IN **MATHEMATICS**.

In 2017, there is a clear need to improve learning outcomes, which seem to have stagnated. Targeting everyone from policy makers, schools and teachers to parents and students, new tools and projects are being developed with the overarching goal of improving learning outcomes.

MATHEMATICS
SCIENCE

STATISTICS ON STUDENT LEARNING

ACCORDING TO THE LATEST OECD PROGRAM FOR INTERNATIONAL STUDENT ASSESSMENT (PISA).

One in five (20%) of 15-year-old students in the U.S. are low performers, not reaching the PISA baseline Level 2 of science proficiency. This proportion is similar to the OECD average of 21%, but more than twice as high as the proportion of low performers in Estonia, Hong Kong (China), Japan, Macao (China), Singapore and Vietnam.

On the opposite end of the performance spectrum, 9% of students are top performers, achieving Level 5 or 6. This is comparable to the average across the OECD of 8%.

HOW EDUCATION IN THE US IS DIFFERENT

THE AMOUNT OF TIME STUDENTS SPEND IN SCHOOL

Thirty states require schools to have a 180-day calendar

Two states ask for more than 181 school days

The rest ask for between 171 and 179 days each year on the official school calendar

According to the OECD, the **international average for days in school is 193** – a full two weeks+ higher than most of the U.S.

In South Korea, it is not uncommon for high school students to spend 16 hours each school day in classrooms

That is more than twice the amount of time that American students spend at school

South Korean students consistently rank at the top of developed nations when it comes to subjects like math and science, vastly outpacing U.S. students

BROADBAND ACCESS FOR EDUCATION

INCREASINGLY, INADEQUATE SCHOOL AND LIBRARY INTERNET CONNECTIONS ARE MAKING SUPPORTING INDIVIDUALIZED TECHNOLOGY-BASED LEARNING FOR ALL STUDENTS MORE DIFFICULT

While nearly all schools and libraries in the country have basic Internet connections, the growing use of computers, tablets, mobile devices and other online applications for education has increased the demand for higher-performance broadband connectivity.

Today, **21 million students in the U.S. are still unable to access digital learning** due to inadequate broadband. The necessary connectivity, along with strategic planning by school districts to maximize its availability, can transform the learning experience for all students, regardless of their background.

HOW STUDENTS ARE EVALUATED

STUDENTS ARE EVALUATED BASED ON WHETHER THEY ARRIVE AT A SET BENCHMARK WITH A "PROFICIENCY" APPROACH IN THE U.S.

There is on-going debate about whether a more customized "growth" approach, which evaluates the progress on an individual student basis, is more effective

The growth-versus-proficiency debate is important for assessing how to hold schools accountable and therefore improve learning outcomes

A survey showed that more than two in three education researchers believe growth is a good way to measure school quality

Just **9 percent** said that proficiency alone, i.e. "raw test scores," is the preferred tactic

According to a study, high-performing education systems such as the Australia, Finland, Hong Kong, Singapore, Sweden and the United Kingdom have assessment systems which

Align curriculum expectations, subject and performance criteria, and desired learning outcomes

Provide feedback to students, teachers and schools about what has been learnt and "feed-forward" information that can shape future learning, as well as guiding college- and career-related decision making

Engage both teachers and students in the assessment process

Focus on the quality of standardized tests rather than the quantity

IMPROVING LEARNING OUTCOMES

TECHNOLOGY IS KEY

Lectures can be replaced by flipped and dynamic classrooms that require students to view lectures ahead of time and answer formative assessments. This allows faculty to focus classroom time on subjects where students have an incomplete understanding

In dynamic classrooms, students are engaged in active learning and utilize mobile devices to respond to follow-up questions in real time

Predictive analytics systems, fed by data gathered before and in class, can help guide both interventions and student expectations

CONNECTING STUDENTS TO NEXT-GENERATION BROADBAND

99%

In June 2013, the Office of Educational Technology established the goal of **connecting 99% of American students to next-generation broadband** in their schools by 2018

NEW CURRICULA DESIGN

Eight out of 10 teenagers play networked, online video games

Engaging Millennial students can be difficult for educator; designing curricula to simulate a video-game environment may help better engage these media-saturated students

Doing so can also provide the analytical-thinking, team-building, multitasking and problem-solving skills employers need

COMMUNITY-CENTERED ENVIRONMENTS

Community centered learning environments are also important for successful student learning, according to new scientific developments

IMPROVE SCHOOL LEADERS' ABILITY IN ALL SCHOOLS

A+ School leadership has the second-largest impact on student outcomes after teacher quality

School leaders play a crucial role in student learning by determining school and classroom conditions

Principals set the vision for their schools, conduct strategic planning and resourcing, and foster the school's learning culture

HOW TECHNOLOGY IS BEING USED TO IMPROVE LEARNING OUTCOMES

SEVERAL ANALYSES HAVE SHOWN THAT TECHNOLOGY CAN ENHANCE LEARNING

Video specifically has been shown to be an effective educational tool according to multiple studies

Because studies show their positive impact on learning outcomes, visual education aids like video are being used in both classroom and research environments

One comprehensive search now includes content in the ProQuest platform and Alexander Street's Academic Video Online

This integration puts vetted, curricula-aligned videos into students' research workflow

Searching text and video in one place enables users to find a comprehensive range of the reliable content they need more quickly, allowing them to **spend less time hunting for information** and more time analyzing it and learning from it

Users will have access to ProQuest platform content as well as more than **50,000 video titles** on essential subject areas including anthropology, business, counseling, film, health, history, music and others

One study of middle school students focused on the acquisition and embedded assessment of physics concepts by having students play the relatively simple video game, Newton's Playground

Players took a traditional pre-test and answered a background questionnaire to assess prior knowledge

In the game, players guide a ball to a balloon across a set of two-dimensional environments that become increasingly challenging

The tasks involve placement and manipulation of ramps, pendulums, levers, and springboard

Students played the game for four hours, during six class periods, and completed the study with a traditional post-test

The study ultimately showed that students who played the game improved their understanding of conceptual physics

Findings also revealed that students who were more engaged in playing the game learned more than those who were less engaged

The assessments embedded in the video game could be utilized as a substitute for traditional classroom assessments

Mindset Works, with funding from the U.S. Department of Education's Small Business Innovation Research program, developed an application to help strengthen academic and social and emotional success

SchoolKit is now used by tens of thousands of students around the country

The app uses animations, assessments, and classroom activities to help students learn a "growth mindset" – the understanding that ability develops with effort

Pilot research in nine middle schools showed significant increases in student growth mindset

This related to increases in learning goals, positive beliefs about effort, and positive academic habits and behaviors like resilience in the face of failure

These changes also related to increases in students' grade point average

LEARNING OUTCOMES IN MUSIC EDUCATION

THE TECHNOLOGY INSTITUTE FOR MUSIC EDUCATORS HAS DIVIDED TECHNOLOGY INTO SEVEN AREAS:

- Electronic instruments
- Music notation software
- MIDI/digital audio sequencing
- Instructional software
- Telecommunications and the Internet
- Multimedia and digital media
- Information processing and lab management

TEACHERS HAVE FOUND THAT TECHNOLOGY CAN NOT ONLY ACT AS A USEFUL ASSESSMENT TOOL, BUT CAN ALSO ENHANCE:

- Cross curriculum teaching
- Hands on and cooperative learning
- Independent study
- Higher level thinking skills

KEY FINDINGS OF RESEARCH RELATING TO MUSIC EDUCATION AND THE USE OF TECHNOLOGY:

Student attitudes toward classroom music are enhanced, and their levels of interest and motivation are sustained over multiple academic years

Hands-on instruction helps students better grasp musical concepts compared with traditional approaches and methods

Music instruction provided through a technology assisted program benefits music educators, creating a sense of professional development and personal growth

Technology can improve student concentration, maximize time on-task

Thanks to advances in technology, we are witnessing the emergence of a whole new approach on how to improve learning outcomes. A revolution is underway, one that offers educators and students alike new tools and methods that will improve student achievement and prepare them for a more competitive labor market.

SOURCES

- [\[1\] http://www.oecd.org/pisa/PISA-2015-United-States.pdf](http://www.oecd.org/pisa/PISA-2015-United-States.pdf)
- [\[2\] https://www.census.gov/newsroom/press-releases/2017/cb17-51.html](https://www.census.gov/newsroom/press-releases/2017/cb17-51.html)
- [\[3\] https://www.forbes.com/sites/ryanraig/2017/01/20/the-top-10-higher-education-issues-we-all-agree-on/2/#36a0fa330d0b](https://www.forbes.com/sites/ryanraig/2017/01/20/the-top-10-higher-education-issues-we-all-agree-on/2/#36a0fa330d0b)
- [\[4\] http://www.ncsl.org/research/education/expanding-broadband-access-for-education.aspx](http://www.ncsl.org/research/education/expanding-broadband-access-for-education.aspx)
- [\[5\] http://1gu4j2i2i3n1b0w0r2zmgua.wpengine.netdna-cdn.com/wp-content/uploads/2017/02/Future-Ready-Overview-Feb-2017.pdf](http://1gu4j2i2i3n1b0w0r2zmgua.wpengine.netdna-cdn.com/wp-content/uploads/2017/02/Future-Ready-Overview-Feb-2017.pdf)
- [\[6\] http://www.theatlantic.com/education/archive/2017/01/deiving-into-one-of-the-questions-betsy-devos-couldnt-answer/513941/](http://www.theatlantic.com/education/archive/2017/01/deiving-into-one-of-the-questions-betsy-devos-couldnt-answer/513941/)
- [\[7\] http://uis.unesco.org/sites/default/files/documents/toward-universal-learning-implementing-assessment-to-improve-learning-2014-en_0.pdf](http://uis.unesco.org/sites/default/files/documents/toward-universal-learning-implementing-assessment-to-improve-learning-2014-en_0.pdf)
- [\[8\] https://www.forbes.com/sites/ryanraig/2017/01/20/the-top-10-higher-education-issues-we-all-agree-on/2/#36a0fa330d0b](https://www.forbes.com/sites/ryanraig/2017/01/20/the-top-10-higher-education-issues-we-all-agree-on/2/#36a0fa330d0b)
- [\[9\] https://www.certipoint.com/Portal/Common/DocumentLibrary/EAB_Whitepaper040808.pdf](https://www.certipoint.com/Portal/Common/DocumentLibrary/EAB_Whitepaper040808.pdf)
- [\[10\] https://www.nap.edu/read/9853/chapter/10#145](https://www.nap.edu/read/9853/chapter/10#145)
- [\[11\] https://www.oecd.org/pisa/PISA-2015-United-States.pdf](https://www.oecd.org/pisa/PISA-2015-United-States.pdf)
- [\[12\] https://teach.ed.gov/connectivity/](https://teach.ed.gov/connectivity/)
- [\[13\] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5132380/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5132380/)
- [\[14\] http://finance.yahoo.com/news/proquest-integrates-text-video-seamless-163000771.html](http://finance.yahoo.com/news/proquest-integrates-text-video-seamless-163000771.html)
- [\[15\] https://teach.ed.gov/netp/assessments/](https://teach.ed.gov/netp/assessments/)
- [\[16\] http://cluflo.org/classes/682_19/media/teaching_tech_intro.pdf](http://cluflo.org/classes/682_19/media/teaching_tech_intro.pdf)

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