STEM in the States:

Impacts of the Every Student Succeeds Act

September 13, 2017
11:00 AM
Making the Most of ESSA: Opportunities to Advance STEM Education

We are Education First, a national, mission-driven strategy, policy and grantmaking effectiveness organization with unique and deep expertise in P-20 education.

We are deeply engaged in supporting states to develop their ESSA plans through policy formation, analysis, stakeholder engagement, plan writing and reviews of drafts.

Our ESSA work is with clients such as the Council of Chief State School Officers, Communities In Schools and direct ESSA plan development and stakeholder engagement in over 18 states.

Education First, with the support of Overdeck Family Foundation, developed this resource to help policymakers, district and school leaders, and advocates learn how states are using ESSA to support STEM education and how they can push those ideas further.

This resource reflects trends, innovations and exemplars in STEM education from 25 draft and submitted Every Student Succeeds Act (ESSA plans). It is not intended to be an exhaustive set of policy recommendations. These slides are a summary of the full report, which is at http://education-first.com/making-essa-opportunities-advance-stem-education/

We wrote this report in July 2017. Since then, the U.S. Department of Education approved some of the draft plans we reviewed. For the most part, STEM proposals stayed intact.
We reviewed 25 ESSA plans in draft form or submitted to USED between April 3- June 26 for STEM mentions and innovations.

**Submitted Plans Reviewed**
- Arizona
- Colorado
- Connecticut
- D.C.
- Delaware
- Illinois
- Louisiana
- Maine
- Massachusetts
- Michigan
- Nevada
- New Jersey
- New Mexico
- North Carolina
- Ohio
- Oregon
- Tennessee
- Vermont

**Draft Plans Reviewed**
- Arkansas
- California
- Iowa
- Maryland
- New York
- North Carolina
- Ohio
- Washington

*Note:* We selected draft plans to review based on recommendations from STEM experts.
We found four high-impact policies that trended throughout the plans. We will examine each one, describing how states can make the most of them. It is worth noting that ESSA plans do not necessarily include all of a state’s STEM initiatives.

- Inclusion of State Science Assessment in Accountability System
- Inclusion of Advanced Placement (AP)/International Baccalaureate (IB) Indicators in Accountability System
- Inclusion of Career and Technical Education (CTE) Indicators in Accountability System
- STEM Elements in 21st Century Community Learning Centers
Seventeen states included or are strongly considering including performance on state science assessments in their accountability systems.

To promote student success, states can:

- Ensure sufficient instructional time, particularly at the elementary level.
- Use data from the accountability system to support equity by directing resources (including teachers) where they are most needed.
- Plan to use all available resources—including out-of-school time, partnerships, and grant opportunities—to address science achievement.

State ESSA plan includes science in accountability system or includes a timeline for doing so in the future.

State ESSA plan does not include science in accountability system.

Not included in this analysis.

Example language: Connecticut: “Indicator 1 - Academic Achievement: Performance indices ranging from 0 to 100 for English language arts (ELA), mathematics, and science are produced by transforming scale scores from the state summative assessments into an index.” (page 34)
Seventeen states included or are strongly considering including CTE indicators in their accountability systems.

To promote student success, states can:

- Link CTE coursework to college- and career-ready standards
- Provide career counseling for CTE students
- Align and coordinate with industry to create a workforce pipeline for in-demand jobs
- Use multiple measures for college- and career-readiness indicators, and disaggregate data for each measure
- Provide access to high-quality career pathways—not merely CTE courses

State ESSA plan includes CTE indicators in accountability system or includes a timeline for doing so in the future*

State ESSA plan does not include CTE indicators in accountability system

Not included in this analysis

*States measured this by access to coursework, completing coursework or a defined pathway, or acquiring an industry credential.

Nineteen states included or are strongly considering including Advanced Placement/International Baccalaureate indicators in their accountability systems.

To promote student success, states can:

- Create and support AP/IB pipelines for both teachers and students.
- Use targeted communication to parents and students to encourage participation in AP/IB courses.
- Use data strategically to ensure resources are going to schools and students who most need support.

*States measured this by course access, course completion, exam taking or exam performance.

Example language: Michigan: “The 11-12 Advanced Coursework indicator uses a 100-point index. This measure is the percentage of 11-12 grade students successfully completing advanced coursework (Dual Enrollment, Early Middle College, CTE, AP, and IB).” (page 28)
Ten states are requiring or encouraging STEM activities in their 21st Century Community Learning Centers grants (21st CCLC)

To promote student success, states can:

- Align 21st CCLC curriculum with K-12 standards without redundancy
- Create programming that is hands-on and active, like experiments and trips to museums
- Focus on equity by exposing students to new experiences and content
- Engage parents to drive interest

* States articulated this in various ways. See Slide 13.

Example language: Louisiana: “Furthermore, priority [for 21st CCLC applicants] is also given to those that propose a program focusing on Science, Technology, Engineering, Arts and Math (STEAM) and those that target ‘D’ and ‘F’ rated schools.” (page 104)
States included STEM in their 21st CCLC plans in a variety of ways, some more prescriptive than others. These states included requirements above what ESSA already allows.

<table>
<thead>
<tr>
<th>State</th>
<th>Stem 21st CCLC Mention in ESSA Plan</th>
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<tbody>
<tr>
<td>California</td>
<td>STEM Power of Discovery cited as a potential TA provider (page 3)</td>
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<td>Connecticu</td>
<td>“Foster[ing] digital learning” is a listed goal (page 73)</td>
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<tr>
<td>D.C.</td>
<td>Providers that “implement STEM programs to inspire and encourage students, by engaging them in hands-on, experiential, inquiry-based and learner-centered activities, including engineering design processes” are given additional “points” in their application (page 62)</td>
</tr>
<tr>
<td>Louisiana</td>
<td>“Furthermore, priority is also given to those that propose a program focusing on Science, Technology, Engineering, Arts and Math (STEAM) and those that target ‘D’ and ‘F’ rated schools.” (page 104)</td>
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<tr>
<td>Maryland</td>
<td>Providers earn additional “points” for “proposing a program whose focus is science, technology, engineering and mathematics (STEM) including all seven State STEM standards of practice.” (page 60)</td>
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<tr>
<td>New Jersey</td>
<td>“... NJDOE requires 21st Century Community Learning Centers grantees to focus on one of the following themes: STEM ...” (the plan lists three other areas) (page 141)</td>
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<tr>
<td>New Mexico</td>
<td>“The STEM focus, and in some instances a STEAM focus (Science, Technology, Engineering, Arts and Math), is an element of every funded 21st CCLC grantee.” (page 145)</td>
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<tr>
<td>New York</td>
<td>“Specific State-level activities currently underway that will continue include: ... STEM/STEAM professional development and other resources are made available to 21st CCLC sub-grantees via the (Technical Assistance Resource Centers, or TARCs) and/or the website that the Centers maintain. The bi-annual professional development events coordinated by the TARCs include STEM and/or STEAM-themed offerings for sub-grantees.” (page 137)</td>
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<tr>
<td>North Dakota</td>
<td>“North Dakota 21st CCLC programing helps in the continuous improvement process by providing children below, at and above the poverty line access to quality out-of-school programing. This programing provides students a safe, nurturing environment and an education anchored in a STEAM curriculum.” (page 110)</td>
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<td>Oregon</td>
<td>“Applications will be based on a local Comprehensive Needs Assessment, encourage connections and alignment between other Title programs, Career and Technical Education (CTE) opportunities, and STEM initiatives ...” (the plan lists two other areas) (page 128)</td>
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Our analysis found fewer similarities in how states planned to use Title II and Title IV dollars for STEM. Title II proposals largely fund improvement of skills and recruitment.

<table>
<thead>
<tr>
<th>Purpose of Title II (in statute) *</th>
<th>State</th>
<th>STEM-related proposal</th>
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<tbody>
<tr>
<td>1. Increase student achievement consistent with the challenging state academic standards</td>
<td>Louisiana</td>
<td>“… teacher preparation providers will be rewarded for placing yearlong teaching residents in rural and high-need schools, and in high-need subject areas.” Note: These high-need subject areas presumably include STEM subjects. (page 71)</td>
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<td>2. Improve the quality and effectiveness of teachers, principals, and other school leaders</td>
<td>Nevada</td>
<td>Nevada “will use the 4% of Title II, Part A funds allowable for statewide activities to improve the preparation, recruitment, evaluation, development, and retention of effective educators. Funds will be prioritized to focus on strategies in the following areas: … Recruitment for Hard to Staff/Shortage Areas …” Note: These hard-to-staff subject areas presumably include STEM subjects. (page 41)</td>
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<td>3. Increase the number of teachers, principals, and other school leaders who are effective in improving student academic achievement in schools</td>
<td>New Jersey</td>
<td>The state will “design, implement and evaluate a comprehensive, ongoing, job-embedded and data-driven professional development plan that focuses on digital literacy … the plan will include current applications to assist students’ understanding of the nature and impact of STEM, computational thinking, coding and technological design and how they relate to individuals, global society and the environment.” (page 93)</td>
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<td>4. Provide low-income and minority students greater access to effective teachers, principals, and other school leaders</td>
<td>New York</td>
<td>“Department regulations also provide for specific pedagogical coursework requirements for accredited teacher preparation programs … Among these requirements are pedagogical coursework requirements that include … (vi) uses of technology, including instructional and assistive technology, in teaching and learning—and skill in using technology and teaching students to use technology to acquire information, communicate, and enhance learning.” (page 121)</td>
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<td>North Carolina</td>
<td>The state has created regionally based cohorts to train local leadership teams on the North Carolina Digital Learning Competencies for Classroom Teachers and School Administrators; there also are regional sessions for classroom teachers. (page 95)</td>
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Note: These purpose statements come directly from the ESSA statute. For more detailed ideas of how Title II can be used for STEM, see the previously mentioned NSTA report and Achieve report, and USED’s own guidance.
Our analysis found fewer similarities in how states planned to use Title II and Title IV dollars for STEM (cont’d). Title IV, Part A can address STEM instruction and professional learning

<table>
<thead>
<tr>
<th>Purpose of Title IV, Part A (in statute) *</th>
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<th>STEM-related proposal</th>
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| 1. Provide all students with access to a well-rounded education  
2. Improve school conditions for student learning  
3. Improve the use of technology in order to improve the academic achievement and digital literacy of all students | Colorado | “Colorado will use funds to support LEAs regarding evidence-based practices to support LEAs in the effective use of technology to improve the academic achievement and digital literacy of all students.” (page 99) |
| | Illinois | Illinois “is considering using Title IV, Part A dollars to support LEAs in offering all students, through the Illinois Virtual School, direct access to standards-aligned courses for high school students, including AP and credit-recovery options.” (page 126) |
| | Maryland | Maryland will “support LEAs in providing programs and activities that improve access and opportunity,” such as “strategies to encourage and provide access to integrated STEM core concepts and practices for all students, specifically for female and students of color.” (page 57) |
| | Michigan | Michigan listed numerous STEM opportunities for Title IV, Part A, including “Professional development for STEM, including coding and game design,” “Professional development on how to embed STEM (engineering design principles, computational thinking, app design) in other content areas,” and “Providing programming to improve instruction and student engagement in STEM, including computer science, and increasing access to these subjects for underrepresented groups.” (page 84) |
| | North Dakota | “Through ESSA, North Dakota schools will be encouraged to incorporate STEM and STEAM learning strategies, competency-based learning programs, and project-based learning frameworks.” North Dakota will “support districts that develop a comprehensive, innovative learning plan that demonstrates innovative practices and increases rigorous learning for students.” Note: North Dakota will use part of its Title IV, Part A funding to support districts with guidance and tools. (page 96) |

Note: These purpose statements come directly from the ESSA statute. For more detailed ideas of how Title IV can be used for STEM, see the previously mentioned NSTA report and Achieve report, and USED’s own guidance.
Thank you! For more information, visit:

www.education-first.com/library
@ed1stconsulting
# The Afterschool Alliance

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<th>Policy &amp; Advocacy</th>
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<td>• National policy</td>
<td>• Translate &amp; synthesize research</td>
<td>• 50 state networks</td>
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<td>o Families &amp; children; STEM</td>
<td>• Issue briefs &amp; reports</td>
<td>• Partnerships for policy, research, &amp; practice</td>
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<td>• Advocacy day on Capitol Hill</td>
<td>• Collect data</td>
<td>• Best practices &amp; models</td>
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<td>• Lights On Afterschool</td>
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<td>• Webinars, blogs, toolkits, &amp; other resources</td>
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**Lights On Afterschool**
A project of the Afterschool Alliance

**America After 3 PM**
STEM has taken off in afterschool

AFTERSCHOOL PROGRAMS ARE STEPPING UP...

...to offer 7 million U.S. kids STEM learning experiences.

70% of parents say afterschool programs should offer STEM. There is especially strong support among groups under-represented in STEM fields:

- Hispanic parents: 76%
- African-American parents: 74%

80% of parents with kids who participate in afterschool STEM programs are satisfied with the STEM learning opportunities

SUPPORT AFTERSCHOOL STEM
www.afterschoolalliance.org/aa3pm
Sources: www.afterschoolalliance.org/AA3PM/STEM.pdf
www.nap.edu/openbook.php?record_id=12190
## Opportunities Guide

The Every Student Succeeds Act (ESSA), enacted last year by an overwhelming bipartisan majority of Congress, has established a number of new, flexible funding streams that states and districts can employ to support improvements in STEM education, and in particular to leverage the enormous potential of informal, out of school, and summer education programs to contribute to both academic and social measures of student success. If we want to employ an “all hands on deck” approach to improve STEM, we must fully utilize these new learning pathways through the opportunities offered by our nation’s primary K-12 education law.

## Talking Points for Advocates

### Crafting a well-framed message about informal, afterschool and summer learning opportunities in science, technology, engineering and math (STEM)

**Four things to keep in mind as you make the case for STEM**

1. **Spell out STEM!**

## Example Letters to State and District

### [State Leader]

**Introduction**

The Every Student Succeeds Act (ESSA), enacted last year by an overwhelming bipartisan majority of Congress, puts an array of key education decisions and flexible funding streams in your hands. In particular, state and local policymakers now have the ability to leverage the enormous potential of informal, out of school, and summer education programs to contribute to our state’s STEM education initiatives.

### [District Leader]

**Introduction**

The Every Student Succeeds Act (ESSA), enacted last year by an overwhelming bipartisan majority of Congress, puts an array of key education decisions and flexible funding streams in your hands. In particular, state and local policymakers now have the ability to leverage the enormous potential of informal, out of school, and summer education programs to contribute to our state’s STEM education initiatives.

[stemedcoalition.org/policy-forum](stemedcoalition.org/policy-forum)
How to speak “STEM-ish”

The Afterschool STEM Hub. Working for policy changes, rooted in research, and backed by smart communications.

www.afterschoolSTEMhub.org

Science, Technology, Engineering, and Mathematics.

Even though everyday life surrounds us with obvious STEM applications, it can still be challenging to make the case for meaningful reforms in STEM learning. It’s harder still when it comes to afterschool settings.

How to speak STEM-ish
AmeriCorps STEM VISTAs support afterschool and STEM Learning efforts

3 STEM Statewide Afterschool Network VISTAs

12 STEM Ecosystem VISTAs in 8 Cities
Afterschool Ambassadors are often located in states with reported afterschool & STEM priorities

STEM emphasis in ESSA state plan

STEM emphasis in “other” policy

*As of June 2017; report by educationfirst
100% of STEM system builders have worked to advance state policies that will promote afterschool STEM over the last year.

7/20 began, for the first time, a focus on STEM afterschool advocacy this year.

High Confidence to engage in STEM policy discussions:

- Prior to Overdeck: 42.1
- This Year: 90.5
Afterschool Networks nearly doubled their contacts with key policy leaders over the year.
$5.25 million in FY18 for afterschool STEM and robotics clubs

HB1402 & HB0115

- Science included as an “other academic indicator” in MD ESSA plan, and STEM is a 21CCLC competitive priority

- Invited to participate in Million Women Mentors Maryland and a Governor’s Workforce Development Board taskforce

- Hosted successful stakeholders meetings with state Sen. Bill Ferguson
Directly from Sen. Sinclair: If not for IAA listening sessions, she would not have insisted on the inclusion of afterschool transportation as allowable usage in SF455

- Invited to Iowa STEM Council Legislative Day on the Hill for the first time
- Hosted 4 STEM in ESSA advocacy trainings for local advocates.
- Hosted two legislative days at the State Capitol. Over 50 legislators and even more staff attended.
- Legislation passed the Iowa House that makes it easier for schools to use state funding for afterschool (H.F. 565). The sponsor is a member of IAA’s Leadership Team.
- Stopped the proposed removal of before-and-afterschool grants program from state code.
Afterschool STEM has an impact

Afterschool STEM programs **excite interest**; help children **gain STEM skills**; and help children to **value** and **identify** with STEM.

**AFTERSCHOOL STEM MAKES A DIFFERENCE**

**4-H TECH WIZARDS**
- 8,000+ kids
- 25 states
- hands-on learning
- professional mentors

95% of participants report...
- mastering skills in web development, GIS and GPS technologies, LEGO robotics
- graduating from high school

**AFTERSCHOOL STEM MAKES A DIFFERENCE**

**TECHBRIDGE**
- 15,000+ girls in 15 years
- Seattle California DC
- career exploration
- field trips

Participants report...
- 80% want to pursue more STEM learning
- 92% are more confident using technology
STEM networks in the age of ESSA

STEMx, proudly managed by Battelle
What’s Battelle?
Battelle inventions

Neurolife: First ever control of paralyzed hand by brain

LS10 Bottle scanner
STEM Education
The school that changed our thinking

Metro Early College High School

2006
Metro High School

• Established in 2006 – inclusive lottery admission
• 100% graduation rate
• 100% college admittance rate
• 85% of students earn college credit
• Student ACT scores consistently beat Ohio’s average (2016: 24.7 vs 22)
2017 study

Students from inclusive STEM schools like Metro:

1. Take more advanced math and science
2. Have higher GPAs and test scores
3. Identify more with science and engage in more STEM extracurriculars
4. Have stronger STEM career interests
5. Have higher aspirations for college
Our philosophy
What we mean when we say “STEM”

Strategies That Engage Minds®

Science Technology Engineering Math
National scope

Ohio
9,000+ teachers trained

Tennessee
500,000+ students impacted

STEMx
21 states and territories
STEMx founded

Battelle and other states founded national STEMx network, today counting 21 states/territories as members

And:
- Guam
- Virgin Islands
- Washington, D.C.
Every Student Succeeds Act
Supporting leadership in our states
Opportunities for STEM in ESSA

• Create space for STEM through accountability
• Train teachers in integrated STEM instruction
• Mobilize resources to support underserved groups
• Support proven STEM programs and innovative approaches

STEM is everywhere. Over 1/4 of new agricultural jobs are dependent on STEM skills.
National campaign to ensure that great STEM teaching and great STEM learning are priorities in states across the nation under ESSA

Created information, tools, and resources to catalyze action and engagement

Targeted education leaders, policymakers, teachers, parents, STEM professionals, and others
State actions

Governor's STEM Action Center
• Talking points to illustrate importance of STEM
• Mobilization tool kits, resources and analyses to create STEM section in State ESSA plan

Non-profit, iSTEM Resource Center
• Resources and talking points to guide stakeholder input
• Op-ed, social media, and other tool kits to push for STEM in State ESSA plan
Connect and learn with us

http://www.stemx.us/sign-up