

## University of Missouri

# Enhancing Missouri's Instructional Networked Teaching Strategies (eMINTS)

**WHAT IS THE IMPACT OF eMINTS COMPREHENSIVE AND eMINTS COMPREHENSIVE PLUS INTEL TEACH ON 7<sup>TH</sup> AND 8<sup>TH</sup> GRADE STUDENTS' MATH ACHIEVEMENT? WHAT IS THE IMPACT OF THESE PROGRAMS ON TEACHERS' USE OF STUDENT-CENTERED, INQUIRY-BASED INSTRUCTIONAL PRACTICES FOSTERED BY TECHNOLOGY USE?**

## Project Overview

### **THE PROBLEM: What Challenge Did the Program Try to Address?**

Forty-four percent of Missouri's rural students qualify for free or reduced-price lunch (FRL), and only 19% of students who qualify for FRL in Missouri scored proficient or better on the 2009 National Assessment of Educational Progress math test (NAEP).<sup>1</sup> Rural schools in Missouri also face challenges with high levels of student mobility, low per-pupil expenditure levels, and a lack of qualified teachers. Of concern are U.S. students' lower scores on tests in areas such as problem solving, communication, collaboration, creativity and innovation, and use of information technology.<sup>2</sup> The evaluators refer to these skills collectively as "21<sup>st</sup> century skills."

### **THE PROJECT: What Strategies Did the Program Employ?**

The eMINTS National Center received an i3 validation grant<sup>3</sup> from 2010-2015 to implement the program in rural middle schools. Together with the Missouri Department of Higher Education (DHE) and the Missouri Department of Elementary and Secondary Education (DESE), the eMINTS (Enhancing Missouri's Instructional

<sup>1</sup> Myers, C., Molefe, A., Dhillon, S., & Zhu, B. (2015). *The Impact of eMINTS Professional Development on Middle School Teacher Instruction and Student Achievement - Year 3 Report*. Washington, D.C.: American Institutes for Research, p. 7.

<sup>2</sup> Ibid.

<sup>3</sup> The eMINT National Center received an i3 validation grant supported by the Validation grants provide funding to support the U.S. Department of Education's Investing in Innovation program through Grant Number U396B100038. Validation grants provide funding to support the expansion of projects that address persistent education challenges to the regional or national level. All i3 grantees are required to conduct rigorous evaluations of their projects. The quality of evidence required to demonstrate a project's effectiveness depends on a project's level of scale or grant type.

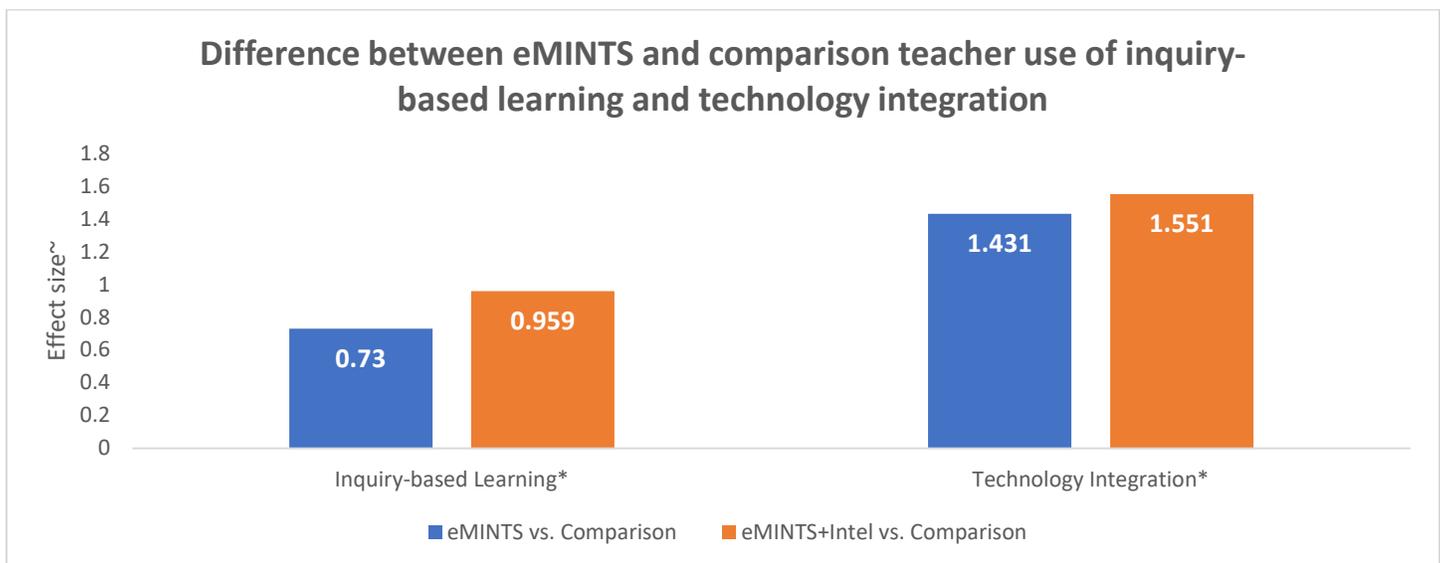
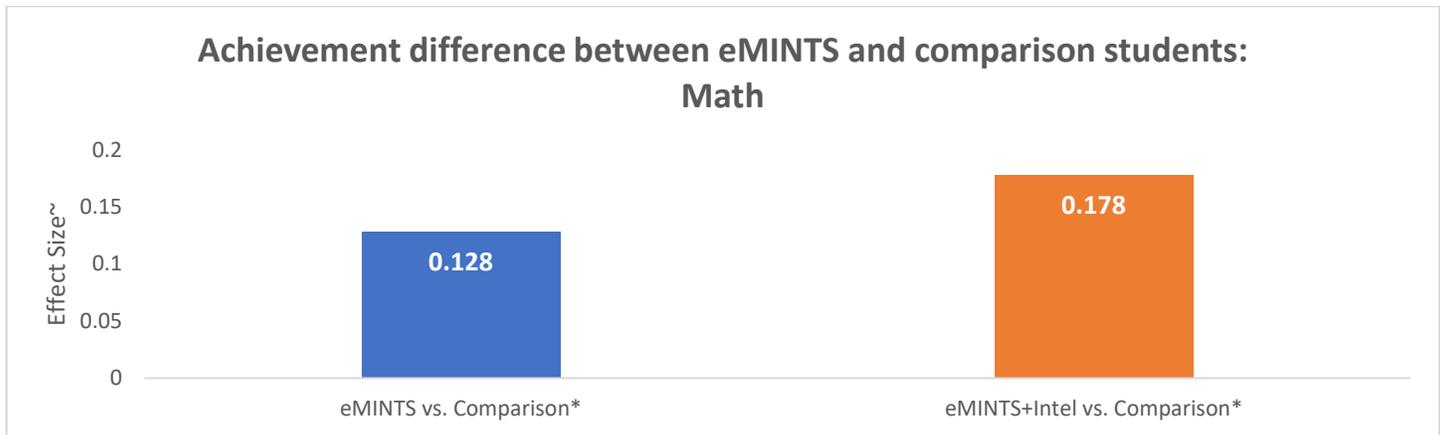
Networked Teaching Strategies) National Center at the University of Missouri provides the eMINTS professional development program to educators in the state. The ultimate goal is to improve students' academic performance and engagement, along with their facility with 21<sup>st</sup> century skills. The core components are listed in the table below. A randomized controlled trial, with schools as the unit of randomization, was employed to evaluate the impact.

### THE eMINTS MODEL

- **Coordination.** An eMINTS instructional specialist (eIS) provided professional development (PD) to teachers and trained principals to monitor and support improvements in teachers' instructional practices. The goal was to create a leadership team within each school to support the adoption and use of the technology infrastructure and equipment used in eMINTS.
- **Technology Integration.** eMINTS includes technology integration instruction within its PD program. The goal is to enhance teachers' instruction. The use of technology supports collaborative and cooperative learning as well as skill acquisition.
- **Community of Learners.** eMINTS aided in establishing communities of learners, marked by respectful communication, positive views of diversity, and an open and encouraging atmosphere.
- **eMINTS + Intel Teach.** eMINTS incorporated the Intel Teach program by combining a 30-hour online Intel Teach course with 12 hours of face-to-face PD.
- **Inquiry-Based Learning.** The eMINTS model combined standards-based instruction with interdisciplinary inquiry-based learning.
- **High-Quality Lesson Design.** eMINTS lessons were designed to include standards-based instruction and embedded formative and summative assessments.

## Summary of Results

**WHAT IS THE IMPACT OF EMINTS ON STUDENTS' MATH ACHIEVEMENT? WHAT IS THE IMPACT OF THESE PROGRAMS ON TEACHERS' USE OF STUDENT-CENTERED, INQUIRY-BASED INSTRUCTIONAL PRACTICES FOSTERED BY TECHNOLOGY USE?**



~Education researchers generally interpret effect sizes as follows: 0.2 = small, 0.5 = medium, and 0.8 = large. If the impact does not have an effect size of 0.2 or greater, it is not meaningful, even if it is statistically significant.<sup>4</sup>

The eMINTS and eMINTS+Intel programs had a positive impact on math achievement and several areas of teaching practice. The details are outlined below.

<sup>4</sup> Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159

- **MATHEMATICS.** Both eMINTS and eMINTS+Intel had positive and statistically significant impacts on student achievement in mathematics relative to student achievement at comparison schools. The differences between eMINTS and eMINTS+Intel effects were not statistically significantly different.
- **INQUIRY-BASED LEARNING.** Survey and classroom observation data indicated that eMINTS and eMINTS+Intel had positive impacts on teachers' use of inquiry-based learning relative to comparison schools. The difference between program and comparison schools was statistically significant.
- **HIGH-QUALITY LESSON DESIGN.** Survey results indicated that eMINTS+Intel schools exhibited significantly more high-quality lesson design than comparison schools. The difference between program and comparison schools was statistically significant.

## SECONDARY RESULTS

No significant differences were found among eMINTS, eMINTS + Intel, and control schools in terms of students' communication arts, technology, and student engagement scores.

Please see Appendices B and C for information about the evaluation's design and the quality of the evidence, respectively.

## OTHER CONSIDERATIONS

The evaluators noted specific limitations regarding this study's findings.

- **CONTEXT.** The evaluation of eMINTS and eMINTS+Intel was implemented in rural Missouri schools with high levels of poverty. However, these schools are not necessarily representative of schools that currently have eMINTS or are considering implementing it. Consequently, this study's findings may not be applicable outside of the context of this sample.
- **MOTIVATION.** Schools in this study volunteered to implement eMINTS, meaning they were highly interested in and motivated to adopt the program. Results may differ if the program is mandated within schools.

## For More Information

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### Evaluation Reports

[Year 3 Evaluation Report](#) (American Institutes for Research, April 2015)<sup>5</sup>

### Additional Reports

[Year 1 Evaluation Report](#) (American Institutes for Research, January 2013)

[Summary of eMINTS Evaluations](#) (Learning Point Associates and eMINTS National Center, April 2015)

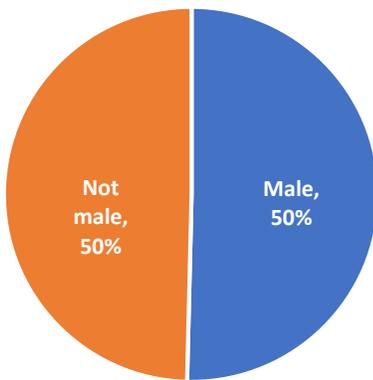
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<sup>5</sup> The information and data for this result summary was collected from the most recent report as of 02/10/2020: "[The Impact of eMINTS Professional Development on Middle School Teacher Instruction and Student Achievement - Year 3 Report](#)", American Institutes for Research, April 2015.

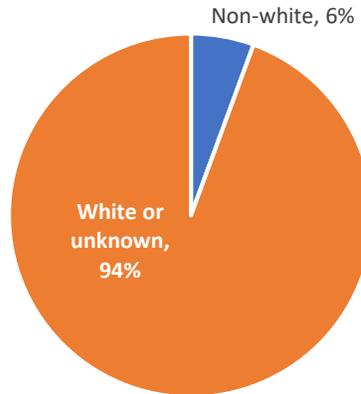
## Appendix A: Students Served by the Project<sup>6</sup>

GRADE(S)													
PK	K	1	2	3	4	5	6	7	8	9	10	11	12

**GENDER**



**RACE/ETHNICITY**



**COMMUNITY**

Not Reported

**HIGH-NEED STUDENTS<sup>i</sup>**

Free/Reduced-Price Lunch	English Learner	Students with Disabilities
60.1%	1.7%	13%

<sup>6</sup>These data reflect the entire student population served by the intervention, not just the evaluation sample used in the impact study.

## Appendix B: Impact Evaluation Methodology<sup>7</sup>

### RESEARCH DESIGN:

<b>Design:</b>	Randomized Controlled Trial
<b>Approach:</b>	<ul style="list-style-type: none"> <li>Participating schools were randomly assigned to either one of two intervention groups or to a control group. The intervention groups received either the traditional eMINTS Comprehensive program or eMINTS Comprehensive plus a third year of professional development using the Intel® Teach program. The data below are for the year 3 analytic sample.</li> </ul>
<b>Study Length:</b>	Three years

### DATA COLLECTION AND ANALYSIS

<b>Study Setting:</b>	Sixty high-poverty rural schools in Missouri
<b>Final Sample Sizes (students):</b>	<ul style="list-style-type: none"> <li><i>Intervention Group (MAP Math):</i> 1,141 eMINTS +; 1,108 eMINTS</li> <li><i>Comparison Group (MAP Math):</i> 823</li> <li><i>Intervention Group (MAP Communication Arts):</i> 1,216 eMINTS +; eMINTS 1,208</li> <li><i>Comparison Group (MAP Communication Arts):</i> 871</li> <li><i>Intervention Group (21<sup>st</sup> Century Skills):</i> 866 eMINTS +; 827 eMINTS</li> <li><i>Comparison Group (21<sup>st</sup> Century Skills):</i> 683</li> <li><i>Intervention Group (Student Engagement):</i> 751 eMINTS +; 868 eMINTS</li> <li><i>Comparison Group (Student Engagement):</i> 659</li> </ul>
<b>Intervention Group Characteristics (MAP Mathematics):</b>	<ul style="list-style-type: none"> <li>Free/Reduced Priced Lunch: eMINTS + 56.3% eMINTS 61.0%</li> <li>Female: eMINTS + 51.8% eMINTS 46.1%</li> <li>Nonwhite: eMINTS + 7.1% eMINTS 4.7%</li> <li>Students with disabilities: eMINTS + 12.6% eMINTS 14.1%</li> <li>Limited English Proficiency: eMINTS + 2.7% eMINTS 0%</li> </ul>
<b>Intervention Group Characteristics (MAP Communication Arts)</b>	<ul style="list-style-type: none"> <li>Free/Reduced Priced Lunch: eMINTS + 54.3% eMINTS 59.3%</li> <li>Female: eMINTS + 51.9% eMINTS 47.7%</li> <li>Nonwhite: eMINTS + 6.6% eMINTS 4.9%</li> <li>Students with disabilities: eMINTS + 11.5% eMINTS 13.1%</li> <li>Limited English Proficiency: eMINTS + 2.6% eMINTS 0%</li> </ul>
<b>Data Sources:</b>	<ul style="list-style-type: none"> <li>Student assessments &amp; survey</li> <li>Teacher survey &amp; classroom observations</li> </ul>
<b>Key Measures:</b>	<ul style="list-style-type: none"> <li>Math and Communication Arts achievement (Missouri Assessment Program (MAP) standardized results)</li> <li>Student engagement &amp; academic orientation (survey)</li> <li>21<sup>st</sup> Century Skills (21<sup>st</sup> Century Skills Assessment)</li> <li>Instructional practices (teacher survey; CLASS-S)</li> </ul>

<sup>7</sup> These data reflect only the evaluation sample in the impact study, not the entire population served.

## Appendix C: Quality of the Evidence

### WHAT WORKS CLEARINGHOUSE REVIEW<sup>8</sup>

STUDY	RATING
<b>The Impact of eMINTS Professional Development on Teacher Instruction and Student Achievement</b> <a href="https://ies.ed.gov/ncee/wwc/Study/81457">https://ies.ed.gov/ncee/wwc/Study/81457</a>	<ul style="list-style-type: none"> <li>▪ Study meets WWC standards without reservations</li> <li>▪ English language arts achievement outcomes: Indeterminate effects found</li> <li>▪ Mathematics achievement outcomes: Statistically significant positive effects found</li> <li>▪ Teacher instruction outcomes: Statistically significant positive effects found</li> </ul>

### EVIDENCE FOR ESSA REVIEW<sup>9</sup>

STUDY	RATING
<b>eMINTS – Math</b> <a href="https://www.evidenceforessa.org/programs/math/middlehigh-school/emints">https://www.evidenceforessa.org/programs/math/middlehigh-school/emints</a>	Strong

### NATIONAL CENTER ON INTENSIVE INTERVENTIONS REVIEW<sup>10</sup>

STUDY	RATING
Not reviewed as of 02/10/2020	N/A

<sup>8</sup> <https://ies.ed.gov/ncee/wwc/FWW>

<sup>9</sup> <https://www.evidenceforessa.org/>

<sup>10</sup> <https://intensiveintervention.org/>

# Investing in Innovation (i3) Grantee Results Summary

Validation, 2010-2015

The [\*Investing in Innovation Fund \(i3\)\*](#), established under section 14007 of the American Recovery and Reinvestment Act of 2009, is a Federal discretionary grant program at the U.S. Department of Education within the Office of Elementary and Secondary Education (OESE). i3 grants help schools and local education agencies work in partnership with the private sector and the philanthropic community to develop and expand innovative practices that improve student achievement or student growth, close achievement gaps, decrease dropout rates, increase high school graduation rates, and/or increase college enrollment and completion rates for high-need students.

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<sup>i</sup> “High-need student” refers to a student at risk of academic failure or otherwise in need of special assistance and support, such as students who are living in poverty, attend high-minority schools, are far below grade level, who have left school before receiving a regular high school diploma, at risk of not graduating with a diploma on time, who are homeless, in foster care, have been incarcerated, have disabilities, or who are English learners. For more information see: [\*Applications for New Awards; Investing in Innovation Fund-Development Grants, 81 FR 24070 \(April 25, 2016\)\*](#).