

Indiana Science Initiative Update: Student Performance on State Accountability Testing from Ten Schools Participating School-Wide for Four Years

August 2014

The I-STEM vision is for Indiana to be a national leader in student achievement and to demonstratively improve college and career readiness in the STEM disciplines.

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Introduction¹ The Indiana Science Initiative (ISI) is a systemic reform of K-8 science education based upon scaffolded guided inquiry using research-based curricular materials enhanced with literacy education. This update investigates the impact ISI has had on student performance as measured by passing rates for ISTEP+ assessments in Science, English/Language Arts (ELA), and Mathematics for all ten of the public schools that participated school-wide in the 2010-2011 pilot program and continued to participate school-wide in 2011-2014. According to the Indiana Department of Education:

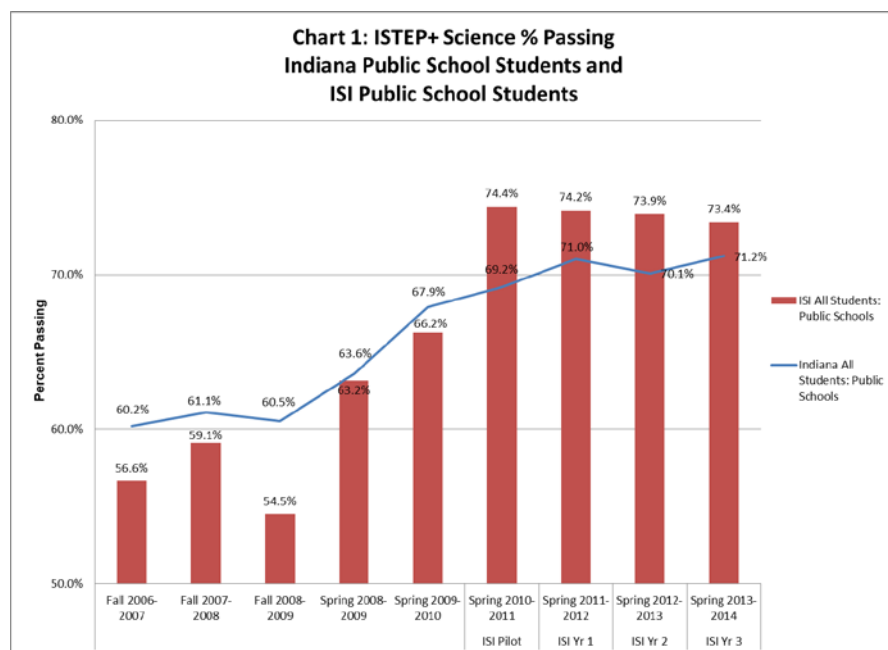
“The purpose of the Indiana Statewide Testing for Educational Progress Plus (ISTEP+) program is to measure student achievement in the subject areas of English/Language Arts, Mathematics, Science (Grades 4 and 6), and Social Studies (Grades 5 and 7). In particular, ISTEP+ reports student achievement levels according to the Indiana Academic Standards that were adopted in November 2000 by the Indiana State Board of Education. An Applied Skills Assessment and a Multiple-Choice Assessment, which are required components of the ISTEP+ program, are used to measure these standards.”

Data Sources and Analysis All data for this update were obtained through COMPASS which is the Indiana Department of Education performance data system (<http://compass.doe.in.gov/dashboard/overview.aspx>). Aliases for schools are used in this update so the document is classified as “Public.”

Results and Discussion

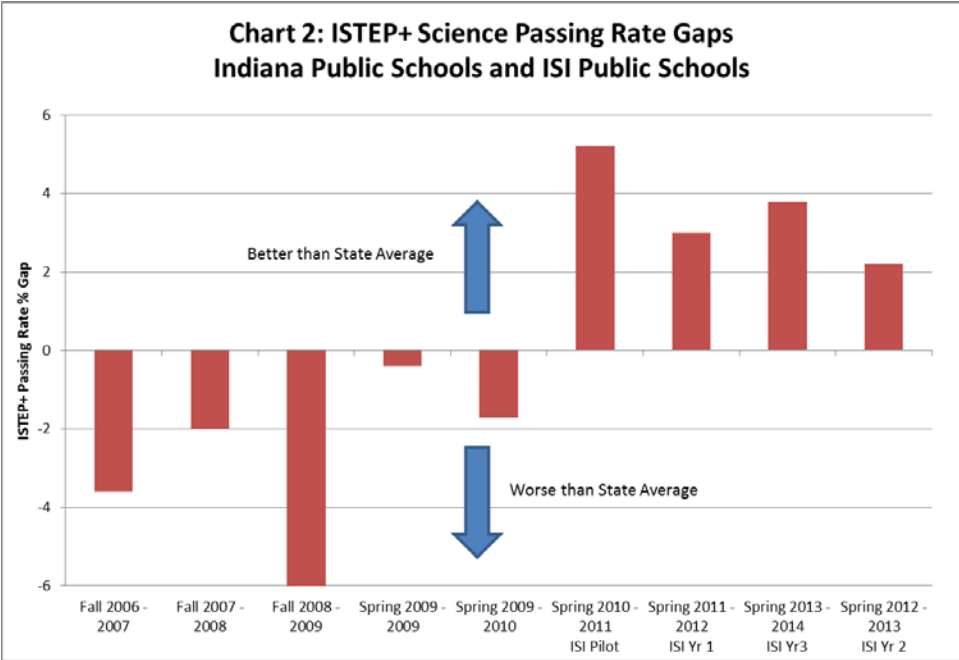
Science

Chart 1 compares the passing rates for all Indiana public school students with ISI public school students on ISTEP+ Science. The chart shows that the overall percentage of ISI students at the 10 schools passing ISTEP+ Science increased about 8%, moving



¹ This is an update to I-STEM Reports issued in 2012 and updated in 2013 (Report 2012-1) and 2014 (Report 2014-04) which summarized ISTEP+ results for the same 10 schools for 2010-2012 and 2010-2013.

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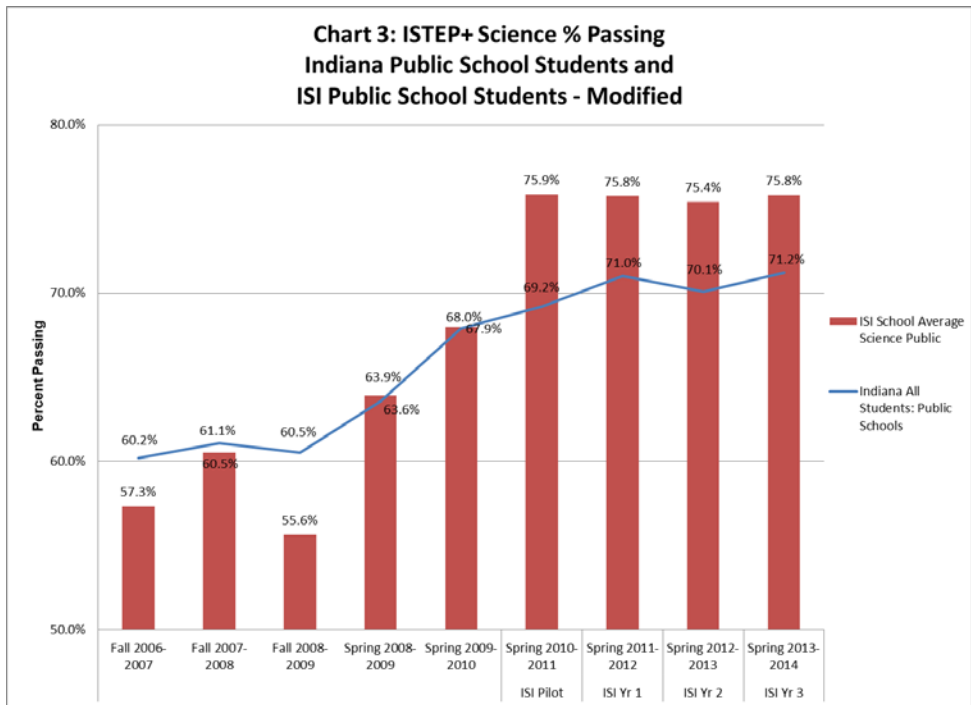


above the state average during the first year of ISI participation.

Chart 2 shows the difference between the State passing rates and the ISI school passing rates for I-STEP+ Science. This highlights the large overall improvement in these 10 ISI schools, where initially all teachers received

ISI professional development, on their I-STEP+ science passing rates.

Of these 10 schools, one school has not been implementing the program with fidelity. This school has less than 8% of the total students within this study. Chart 3 shows the same data as Chart 1 but with this school’s data removed. Not only do all scores rise, but scores during the ISI remain much more consistent and no longer minimally decline as they do in Chart 1.



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English Language Arts

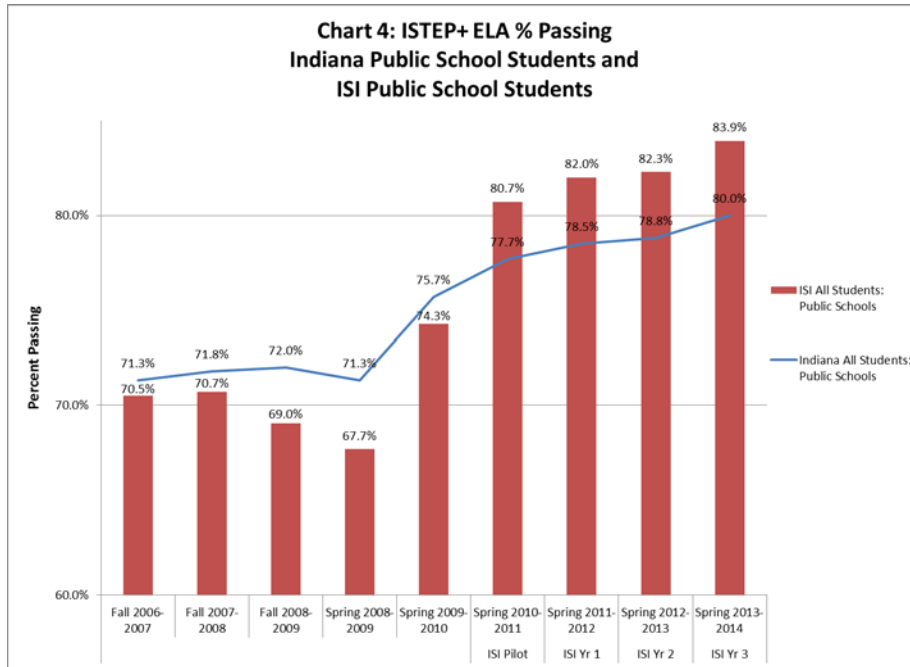


Chart 4 compares the passing rates for Indiana public school students with the 10 ISI public school students on ISTEP+ ELA. The chart shows that the overall ISTEP+ ELA passing rates for the ISI schools increased about 10%, moving above the state average corresponding with their first year of ISI participation. The

passing rate trends for ELA mirror the passing rate trends for Science. This outcome may reflect the fact that ISI is a science and literacy program.

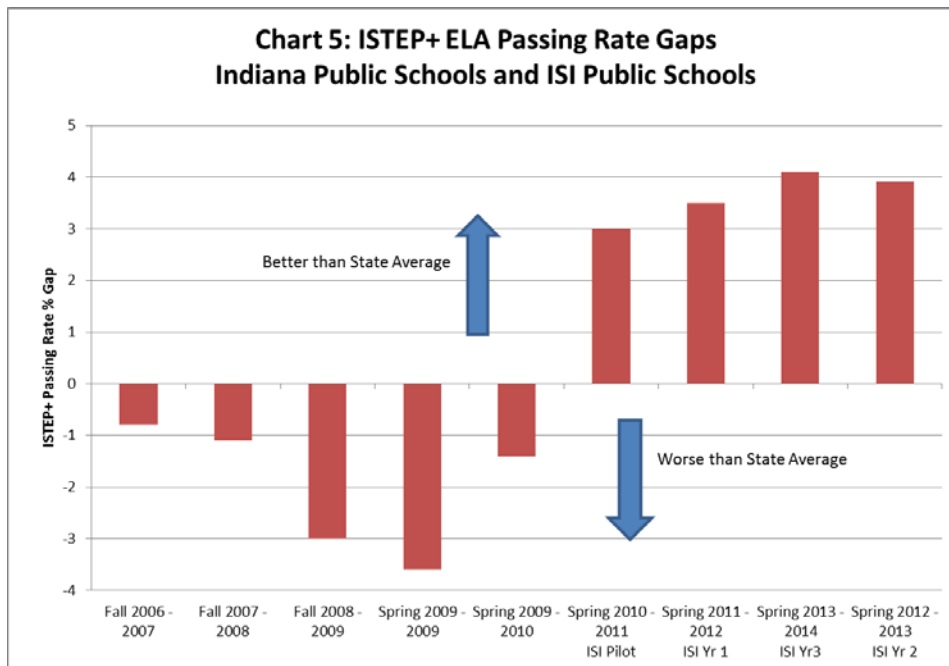
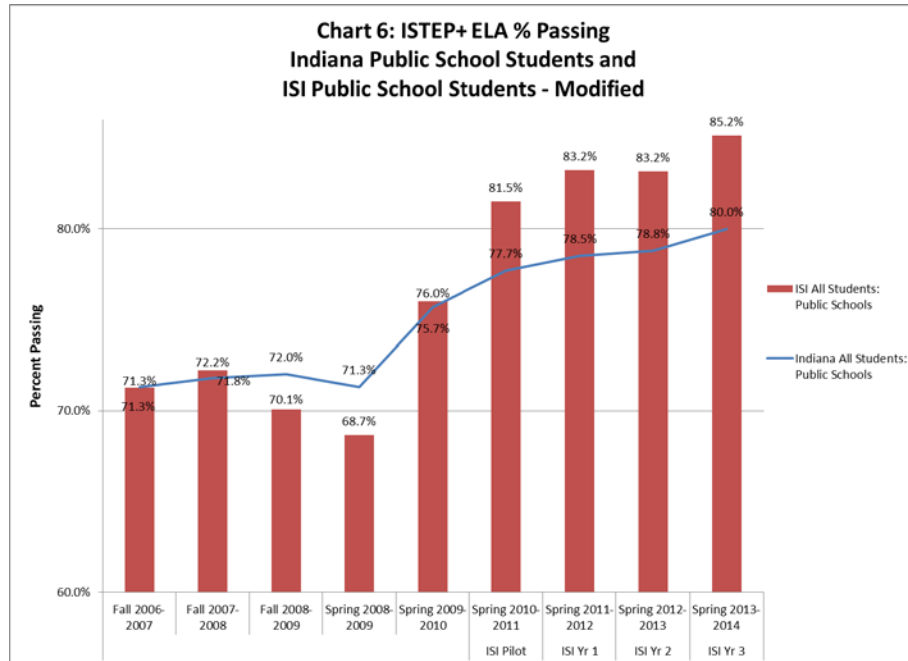


Chart 5 shows the gaps between the State average ISTEP+ passing rates and the ISI school passing rates for ELA. These data highlight the large improvement in ELA passing rates corresponding with the use of ISI curriculum and teacher training at these 10 schools.



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Chart 6 shows the ELA data without the one school that has not been implementing with fidelity. As before, all scores do moderately increase as does the overall increase since starting the ISI.



Mathematics

Chart 7 compares the mathematics passing rates for Indiana public school students with the 10 ISI public school students on ISTEP+. The chart shows that the overall ISTEP+ Math passing rates started and have stayed below the state average, but the gap in math achievement narrowed to less than one percent and this small gap has remained consistent.

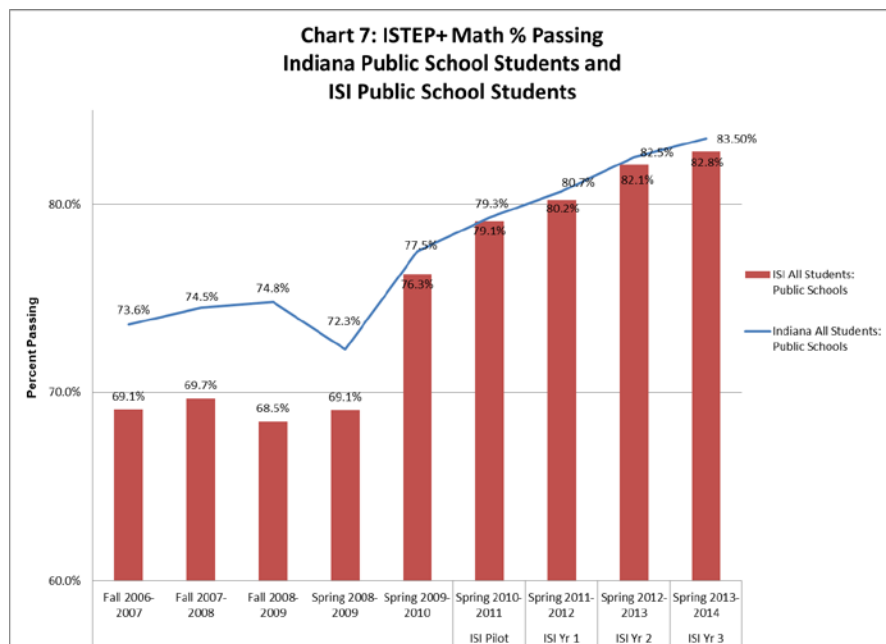


Chart 8 shows the gaps more explicitly. This narrowing may be supported by ISI due to the fact that students have opportunities to apply mathematical understandings during ISI science activities.



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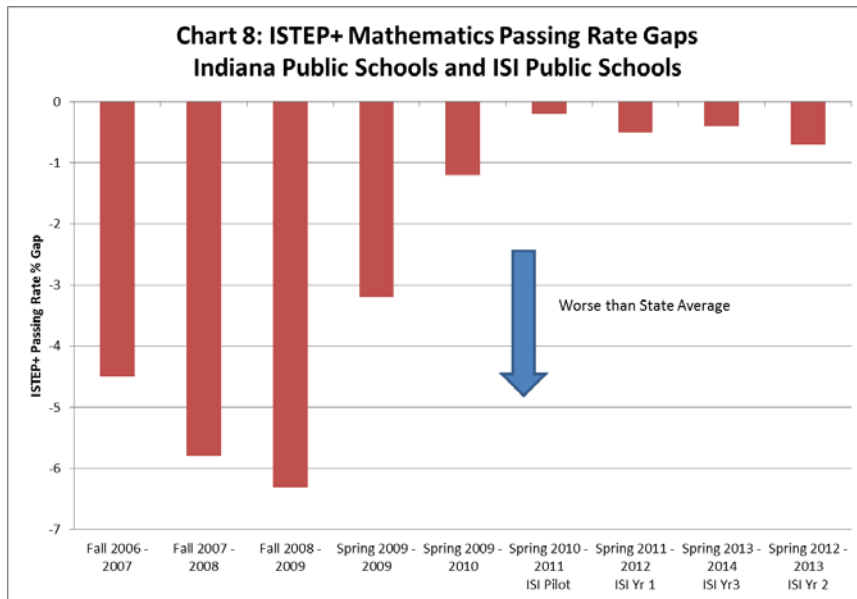
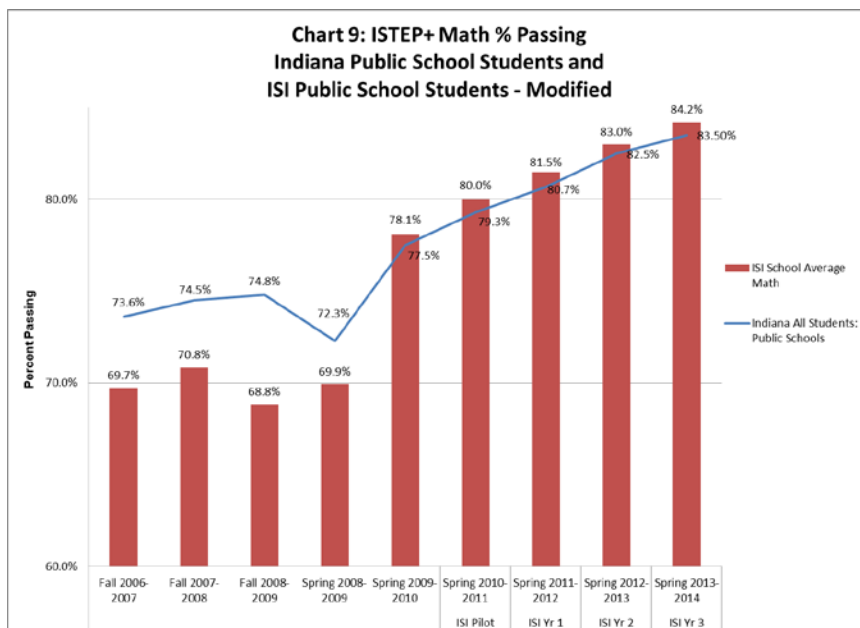
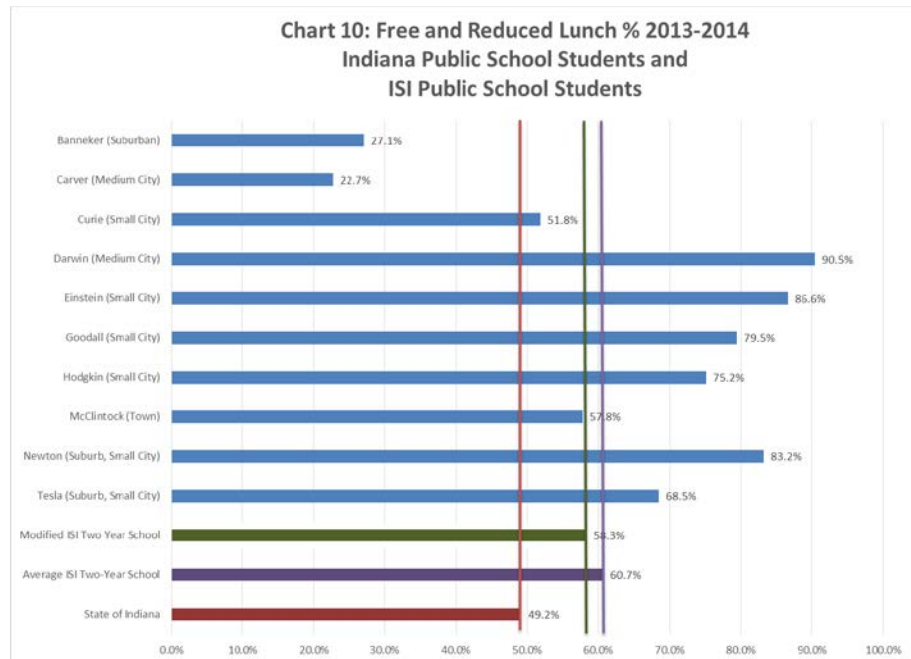


Chart 9 provides the mathematics scores without the one school. Math scores for ISI schools are now above the state average but the general growth has remained the same. This consistency in growth is expected because the ISI has not focused on mathematics as a component of the program, therefore we wouldn't expect to see increased growth when removing the one school.



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Two items are important to note when considering this data. First, in the initial two years of ISI (pilot and year 1) most teachers only received curricular modules addressing standards in physical science and earth science which means that students were involved in ISI instruction for only half of the school-year. Full school-year implementation started in 2012-2013. Second, the ten ISI schools have a 2012-2014 Averaged Free and Reduced Lunch Rate [FRL%] of 60.7% in comparison to the Indiana average FRL% of 49.2%. With the one school removed the free and reduced lunch rate for the other 9 schools is 58.3%, still 9% above the state average. Chart 10 summarizes the FRL% for the ISI schools and shows that five of the schools in the report have FRL% higher than 70% and only two of the ISI schools have a lower FRL% than the state average. This is an indicator that the ISI schools in this report have a lower socioeconomic status than the Indiana average.

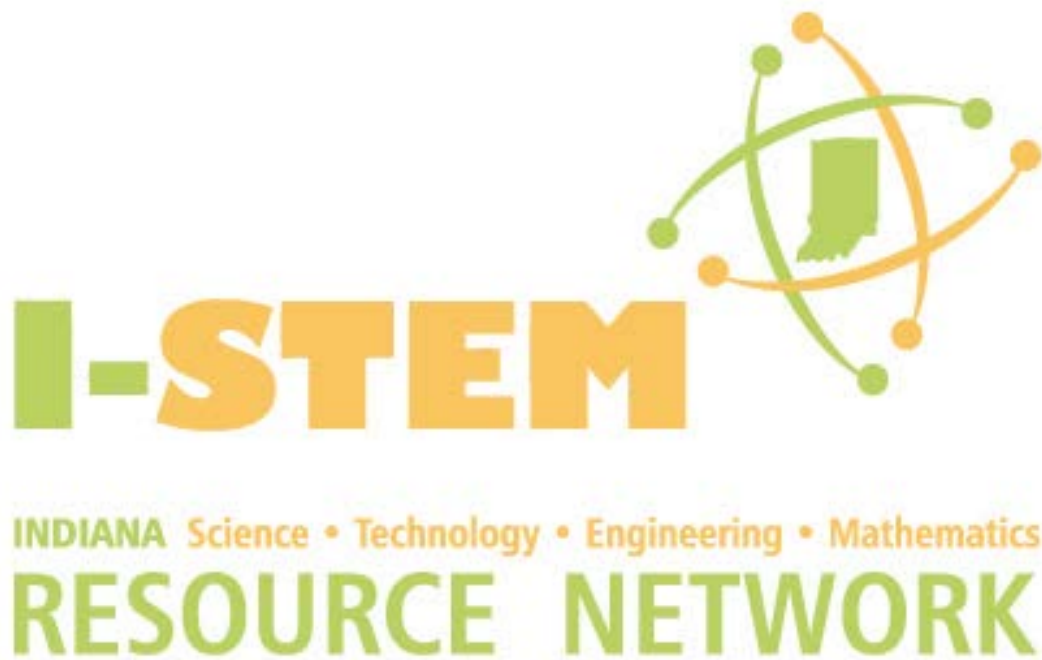


Summary and Next Steps The charts above show a positive correlation between the ISI effort and increased Science and ELA skills as measured by ISTEP+. These results are based on a relatively small group of 10 schools. Nevertheless, these results are very encouraging.

These results also are in line with the previously-reported ISTEP+ results for these same 10 schools for 2010-2013. The effects observed in this previous study have been extended for another year by the results reported here.

I-STEM is currently working with TERC and the STEM Education Research Institute (SERI) at IUPUI to access the broader ISTEP+ database from the Indiana Department of Education. This will enable a more in-depth analysis of the impact of ISI on student performance as measured by ISTEP+. This analysis will include student-level performance over several years, and include professional development as another factor.

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