



# Indiana Science Initiative Update: Summary of Interviews, Visits, and Surveys with Administrators, Principals, Instructional Coaches, and Teachers

December 2012

*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.*

## Overview

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The Center for Evaluation and Education Policy (CEEP) at Indiana University is serving as the external evaluator for the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* under a contract with the I-STEM Resource Network. As part of the evaluation of the Program, CEEP staff members are collecting a variety of information about the program's implementation and impact in schools from key stakeholder groups.

During April and May 2012 phone interviews were conducted with seven individuals from Avon Community School Corporation, Logansport Community School Corporation, and Richmond Community School Corporation about their experiences with the program. These three districts have implemented the program in 2-7 schools and across a variety of grade levels (kindergarten to middle school).

Dr. Mary Piontek, Senior Research Associate at CEEP, developed the interview protocols and conducted the phone interview sessions. Twenty-two individuals were invited to participate in the interview process through an electronic mail invitation. Seven individuals agreed to participate: two district-level administrators, two school principals, and three instructional coaches/trainers. The phone interviews lasted approximately 15-30 minutes and each participant completed a consent form prior to the interview sessions. Dr. Piontek also visited schools in the three districts.

Participation in the interview sessions was voluntary. There was no compensation for participating in the interview, and individuals could decline to answer any questions they chose. Dr. Piontek took handwritten notes during the interviews. Participants' identities are confidential. No individuals are identified in this report by name or demographics that would allow for identification.

All interview data is reported in the aggregate; common themes and evidence of impact are reported across all interviews. This document is intended to provide formative feedback to the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* for its ongoing program implementation and refinement.

## Summary of Interviews

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Three interview protocols were developed, one each for district administrators, school principals, and instructional coaches/trainers. Primary topics included (1) program implementation and quality, (2) support for the program, (3) impact on teachers' pedagogical practice, and (4) impact on students' interest in science. The summary is organized by the four topics.

Each individual was allowed to answer as many questions as s/he wished and in as much depth as each felt appropriate across the four topics. Therefore this document is not meant to be an exhaustive description of all possible topics related to the Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program, but rather highlights areas that the participants' most frequently and fully discussed.

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### PERCEPTION OF PROGRAM IMPLEMENTATION/QUALITY

Interview participants, including district-level administrators, school principals, and instructional coaches/trainers were very complimentary of the program and its staff members. The *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* was described by the interview participants as a structured, research-based science program that fills a gap in districts' science curricula, especially at the lower-elementary grades. The use of multiple kits reflecting a variety of content and process areas was widely praised. Administrators, principals, and coaches/trainers all perceive the program as being aligned with Indiana's Academic Standards for Science and fitting seamlessly into other science initiatives in the state and districts, including grants provided by the Indiana Department of Education to build capacity for science education.

The staff members of the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* are viewed as extremely professional, dedicated, and responsive. Those schools that were part of the pilot-phase of the program specifically mentioned the interest of program staff in ongoing, constructive criticism of the design and implementation of the science kits. While not always logistically feasible, program staff members have also been flexible to changing the order in which the kits arrive for a given school or district so that the topics more closely match with thematic instruction.

The opportunity for coaches/trainers and teachers to be trained in the science kits they will be using with their own students was mentioned as a key element of the professional development provided by the program. Ongoing professional development throughout the school year and smoothly running logistics for the delivery and refurbishing of the self-contained science kits were also mentioned as strengths of the program. While some interview participants noted that the quality of presenters at the professional development workshops has varied during the first few years of implementation, program staff members have been very responsive in evaluating the quality of the workshops and ameliorating any issues.

Administrators and principals suggested additional opportunities for them to be trained in how to observe and evaluate the science lessons being implemented in their schools. Principals will be responsible for implementing new teacher evaluation systems and having a deeper understanding of the pedagogy and expectations for student learning in the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* is important.

Another key element of the program's curricula is the integration of literacy and communication skills into the science investigations. The use of notebooks for students to record, evaluate, and communicate their observations and experiments was praised by all interview participants. Coaches/trainers suggested adding additional sessions at the program's professional development workshops for teachers to further practice how to use the notebooks with their students, how to integrate the literacy techniques used in the notebooks with other literacy instruction, and how to assess the quality of the students' work.

Interview participants also suggested that the program create, in partnership with districts, lists of books and other instructional resources that complement the science kits that teachers could use to enhance their students science learning before, during, and after the kits. Although some of the science kits include basic assessments for measuring student learning, some participants suggested that additional assessments for each kit/topical area would enhance the overall quality of the kits and encourage teachers by allowing them to better understand what and how their students are learning.

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### SUPPORT FOR AND INTEREST IN THE PROGRAM

Support for and interest in the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* has been strong in the three districts. Administrators noted that district-level curriculum committees were very complimentary of the program’s design and were impressed with the implementation in their districts to date. Principals have observed students excitement about engaging in science and teachers increased interest in using inquiry-based instruction. Support for the increased emphasis on science instruction was voiced by the district-level administrators and school principals who all felt that participating in the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* was a significant opportunity for their teaching staffs and students.

The program’s use of kits across topical areas and grade levels enables teachers within and across grade levels to meet to co-plan the use of the science kits, share instructional techniques, and debrief about their experiences with their students. Although some coaches/trainers noted that teacher who are less experienced with teaching science have been concerned about using the curricula/kits, the high quality professional development and ongoing support provided by the coaches/trainers and program staff have been very helpful in easing teachers’ anxieties.

As more schools within districts, and grade levels within schools, adopt the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* principals and coaches/trainers could encounter more resistance to the program as larger numbers of teacher unfamiliar with science content and instructional techniques are involved; therefore, principals and coaches/trainers noted that the ongoing professional development provided by the program and support of peers in the schools/districts will continue to be important as implementation expands.

The interview participants did not note any major barriers to implementation, but as with any new curricula finding strategies for teachers to integrate the science instruction with literacy and mathematics instruction was important. The three districts were able to access additional resources and grants from the Indiana Department of Education to enhance the implementation of the program and further build capacity and sustainability of science education.

### IMPACT ON TEACHERS’ PEDAGOGICAL PRACTICE

The *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* was described as enhancing teachers’ pedagogical practice. The strong curricular design and professional development program allows teachers to practice hands-on with the science kits, model the use of the notebooks and reflection techniques, review and adapt teacher manuals, and gain a deeper understanding of the program’s alignment to academic standards and critical thinking processes.

As noted earlier, although some teachers, especially at the early elementary level, are unfamiliar with science content and instructional techniques, the design of the science kits does not depend upon an exhaustive understanding of the topics being investigated, but rather encourages inquiry-based learning through students’ hands-on experimentation and observation. Students discuss and record hypothesis, observations, analysis, reflection, and conclusions about the phenomenon being investigated, allowing teachers to integrate written and verbal communication pedagogy into the science lessons. Coaches/trainers noted that they have been able to concentrate on working with teachers on guided inquiry instructional techniques and science investigation processes that promote



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students' critical thinking, rather than on rote learning of basic science concepts. Principals noted that they focus on further encouraging teachers to use pedagogy that supports critical thinking and 21<sup>st</sup> century learning skills, while tracking (where possible) evidence in state and district assessments of student achievement in literacy, mathematics, and science.

Interview participants noted that a few schools have partnered with local science centers and community resources to create field trips and extended learning opportunities based on the topics covered in the science kits, and individual teachers and librarians are creating mini-science collections to complement the science kits. Teachers across grade levels have expressed to principals and coaches/trainers students enthusiasm for the science kits and interest in exploring future science topics. As teachers have experienced students' positive engagement with science, coaches/trainers noted teachers' increased comfort level with the instructional techniques and increased sharing among peers about their instructional strategies.

### IMPACT ON STUDENTS' INTEREST IN SCIENCE

Students' high level of enthusiasm and interest in the science kits was mentioned by every interview participant. The phrase "the kids are having fun while learning" was used frequently. Students are working in groups and engaging in discussions about science, as early as kindergarten. The topics of the kits appear to have broad appeal for the students, across grade levels, and the opportunity to engage in hands-on experimentation creates excitement and enthusiasm for learning.

Parents have mentioned to principals their children's enthusiasm for the experiments, and some students have continued to collect data and investigate scientific phenomenon at home, that they later share with their teachers and peers in school. Students have asked for additional reading materials about science and about upcoming topics so that they can conduct pre-research on their own through internet and library resources.

The use of the notebooks has encouraged verbal and written communication in all grade levels. One interview participant noted that recent *Acuity* scores in mathematics and language arts were strong at his/her school in areas that are explicitly integrated into program's curricula. Another interview participant mentioned that in reviewing students' responses to the spring 2012 *I-STEP* writing prompts teachers in his/her school observed a difference in the quantity and quality of writing, especially related to explanation and analysis.

### Summary of Site Visits

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In November 2012, Dr. Mary Piontek of the Center for Evaluation and Education Policy (CEEP) at Indiana University visited several elementary schools as part of the evaluation data collection for the Indiana Science Initiative's *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program*. Dr. Piontek and other CEEP staff members of the evaluation team support the work of Brandon Sorge, Director of Operations, I-STEM Resource Center; and Jennifer Hicks, I-STEM K-12 Science Program Manager. The following are summary comments from these visits. It is not meant to capture all of the conversations and learnings from the visits, but rather is to provide collegial feedback to inform the implementation of the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program*.

**Avon Community Schools** Dr. Piontek met with White Oak Elementary Principal, Annette Patchett

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and Elementary Science Coach for Avon Community School Corporation, Jennifer Kruse. Dr. Piontek also met with teachers in Kindergarten through 4th grade to discuss their experiences with the science kits. On November 30, 2012 Dr. Piontek met with River Birch Elementary Principal, Kris Kingery and Assistant Principal, Heather Gorgas. She also met with teachers in Kindergarten through 4th grade. At both schools Dr. Piontek observed science lessons across a variety of grade levels.

Schools' Cultures The school administrators at both schools were very enthusiastic about piloting and adopting the science kits, and noted that Jennifer Kruse is instrumental in coordinating the logistics of the distribution and implementation of the science kits.

Most teachers described being comfortable with implementing the science kits; although some teachers had not participated in the summer workshops provided by the I-STEM program. Jennifer Kruse has strategically identified teachers who have not yet been trained in the science kits at all grade levels and is providing small group training on each kit with teachers in the respective grade levels throughout 2012-2013.

Within Avon Community School Corporation, there is a partnership with Eli Lilly and Company that provides visits by scientists from Lilly to select classrooms to teach science content and lessons. This science instruction is not a part of the Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program.

Across elementary schools in the district, most science teaching takes place during the last 90 minutes of the school day; thereby limiting the number of classrooms that Ms. Kruse can observe and support on a given day.

Not surprisingly, science is seen as having a higher priority by teachers in the grade levels where science (student achievement) is measured as part of the district/state assessment system, beginning at Grade 4. Teachers at the 4th grade level noted that the four kits vary greatly in their reading level and expectation of prior knowledge.

Use of Science Kits in Classrooms High quality and thoughtful support for teachers is being provided by Jennifer Kruse, Elementary Science Coach. She has created curricular materials to guide each lesson in each science kit (in PowerPoint format) for teachers to use in their instruction. She has also been responsible for the ongoing communication with I-STEM staff and vendors to ensure efficient delivery of the kits and that each kit has the correct type and number of materials to implement each lesson.

Teachers at both schools noted that within each grade level the science kits cover a limited scope/scale of STEM standards. Some teachers have created additional student activities to cover scientific content and inquiry processes in state/national standards.

Teachers also noted that the order of the kits works better at some grade levels than others (i.e., kits that require outdoor activities arriving in February is not ideal), and are curious as to how and who made the decision for the “order” at the district-level and at I-STEM.

Teachers praise the support of Ms. Kruse in volunteering to model and co-teach any lessons in any kit with them. Some teachers described needing to “try out, through trial and error” each kit once before fully understanding the potential of each lesson. Teachers in both schools also noted their teaching peers are collegial and share “tips and techniques” for implementing the science kits effectively and efficiently.

The notebooking process of science curriculum is implemented in a variety of ways and with varied



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success; most teachers are flexible in using the notebooking with their students to encourage engagement in writing/recording.

Student Engagement and Learning During the observations of science lessons, majority of students were engaged and enthusiastic about the lesson and the scientific inquiry. Teacher at both schools describe the high interest and energy of students during the hands-on inquiry lessons (at all grade levels) and this was evident in each of the classrooms observed at White Oak and River Birch Elementary Schools.

Students had the opportunity to work in teams/pairs with peers and learn social/teamwork skills. Children at all grade levels quickly learned and applied science vocabulary, and demonstrated their learnings during the notebooking activities.

**Logansport Community School Corporation** Dr. Piontek met individually with Fairview Elementary Principal, Christine Hess and Elementary Science Coach for Logansport Community School Corporation, Michael Miller. Dr. Piontek also met with teams of teachers in Kindergarten and 1st, 2nd, and 3rd grades; and individually with the Cross Categorical teacher and the 5th grade teacher who provides science instruction for grades 4th and 5th at Fairview Elementary. During the site visit, she also observed two science lessons (Kindergarten and 5th grade classroom).

School Culture The school administration was very enthusiastic about piloting and adopting the science kits. Principal is savvy at leveraging community resources to expand/enhance students' quality of life and education, e.g., science education experiences for students (Ivy Tech).

Most teachers described being comfortable with implementing the science kits, although some teachers felt their training/exposure to the kits was not of the highest quality (note: I-STEM staff are aware of the training deficiencies that occurred in past summer institutes).

Not surprisingly, science is seen as having a higher priority by teachers in the grade levels where science (student achievement) is measured as part of the district/state assessment system.

Use of Science Kits in Classrooms High quality and thoughtful support for teachers is being provided by Michael Miller, Elementary Science Coach. He is strategically creating resources linked to educational standards (e.g., Indiana, Common Core) and assessments (e.g., Acuity) for expanded science curricula that teachers can easily access. These additional resources are vital; the science kits cover a limited scope/scale of STEM standards.

The school utilized creative pairing/teaming of teachers during pilot-phase (to observe other teachers who had received training) and to ensure that all students in a grade-level received science instruction. The school uses specialized scheduling to deliver 4th and 5th grade science instruction.

Some teachers described needing to “try out, through trial and error” each kit once before fully understanding the potential of each lesson. Teachers noted their teaching peers are collegial and share “tips and techniques” for implementing the science kits effectively and efficiently.

The notebooking process of science curriculum is implemented in a variety of ways and with varied success; most teachers are flexible in using the notebooking with their students to encourage engagement in writing/recording.

Student Engagement and Learning During the observations of science lessons, majority of students were engaged and enthusiastic about the lesson and the scientific inquiry. Students had the opportunity to work in teams/pairs with peers (observed in 5th grade lesson) and learn

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social/teamwork skills. Kindergarten students quickly learned and applied science vocabulary, and demonstrated their learnings during the notebooking activities.

Students with a variety of special needs seem to respond well to inquiry based learning and have expressed an interest in science; working with their general education peers provides both social and academic enrichment.

**Richmond Community School Corporation** Dr. Piontek met with Crestdale Elementary Principal, Sheila Hobbs and Elementary Science Coach for Richmond Community School Corporation, Lori Fields. Dr. Piontek also met with teachers in grades 1-4 to discuss their experiences with the science kits. Because no science kits were currently at the school, science lessons were not observed during the site visit.

School Culture The school administration was very enthusiastic about piloting and adopting the science kits, and supportive of teachers' interest in expanding science curriculum resources.

Most teachers described themselves as being comfortable with implementing the science kits. Through the recommendation of two teachers at Crestdale who attended the 2012 National Science Teachers Association (NSTA) conference, additional science curriculum resources are being purchased (Picture-Perfect Science from NSTA Press).

The district implemented new mathematics and literacy/language arts curricula in 2011-2012, and expanded the science kits to additional schools/grade levels in 2012-2013. Administrators and teachers are adjusting to these multiple changes over time.

Use of Science Kits in Classrooms High quality and thoughtful support for teachers is being provided by Lori Fields, Elementary Science Coach. She is identifying additional resources for expanded science curricula that teachers can easily access, and working with I-STEM staff members to coordinate additional trainings in 2013 on instruction and curriculum planning.

Teachers noted their teaching peers are collegial and share "tips and techniques" for implementing the science kits effectively and efficiently.

The notebooking process of science curriculum is implemented in a variety of ways and with varied success; most teachers are flexible in using the notebooking with their students to encourage engagement in writing/recording.

### Summary of Survey Data

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During October and November 2012 an online survey was distributed to 306 teachers in Indiana from Avon Community School Corporation (117 teachers), Logansport Community School Corporation (88), and Richmond Community School Corporation (101) about their experiences with the program and how the curriculum kits were being implemented classrooms and schools. These three districts have implemented the program in multiple schools and across a variety of grade levels (kindergarten to middle school).

Dr. Mary Piontek, Senior Research Associate at CEEP, developed the survey instrument with feedback





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from the staff members of I-STEM, distributed and managed the survey, and conducted the data analyses. The survey consists of forced choice, rating scale and open-response items, and was created using Qualtrics survey software. The three-hundred-and-six individuals were invited to participate in the interview process through a personalized electronic mail invitation. Participation in the survey process was voluntary. There was no compensation for participating, and individuals could decline to answer any questions on the survey instrument they chose. All survey data is reported in the aggregate.

The survey instrument was developed to capture teachers' perspectives and feedback on their experiences with the *Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program*, especially how the curriculum kits were being implemented in their classrooms and impact on student learning. A follow-up survey will be distributed in spring 2013 to further capture teachers' experiences and feedback.

### Respondent Demographics

A total of 102 teachers responded to the survey: 55 from Avon Community School Corporation (55/102 total respondents= 54%); 19 from Logansport Community School Corporation (19/102=19%); and 28 from Richmond Community School Corporation (28/102 = 27%). For Avon Community School Corporation, the fifty-five respondents represent 47% of the 117 teachers who received an email invitation to participate in the survey process. For Logansport Community School Corporation, the nineteen respondents represent 22% of the 88 teachers; and for Richmond Community School Corporation, the twenty-eight respondents represent 28% of the 101 teachers who received an invitation to participate in the survey process.

### Perception of Program Quality and Impact

Respondents were asked to rate their level of agreement with statements about the general impact of the *Literacy Enriched Science Through Guided Inquiry Program* (see Table 1). On a scale of 1-4 with 1=Strongly Disagree and 4=Strongly Agree, the statement with highest mean (i.e., level of agreement) was: *Students in my classroom have developed deeper interest in science because of the curriculum kits* with a mean of 3.38. The statement with the lowest mean (i.e., level of disagreement) was: *Parents/guardians of my students are more interested in "writing across the curriculum" literacy activities because of the Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program* with a mean of 2.22. The statements about parent/guardian interest had the lowest means, but it should also be noted that 23-27% of respondents rated the statements as "Do Not Know."

### Perception of Student Learning Through the Use of the Science Curriculum Kits

Respondents were asked to rate their level of agreement with statements about student learning through the use of the science curriculum kits (see Table 2). On a scale of 1-4 with 1=Strongly Disagree and 4=Strongly Agree, the statement with highest mean (i.e., level of agreement) was: *The curriculum kits improve students' abilities to collect information/data* with a mean of 3.32. The statement with the lowest mean was: *The curriculum kits improve students' abilities to assess the quality of their own work* with a mean of 2.90. Overall respondents agreed to the statements about positive impact on student learning (mean range of 2.90 to 3.32).

The data suggests that there has not been a lot of impact on parents and their perceptions through the implementation by these schools of this program. However, teachers do feel that the program has had a positive impact on school focus on science, teacher confidence in teaching science, and student learning and abilities related to science content, science processes, problem solving, data organization and manipulation, and communication skills.

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**Table 1: Respondents' Level of Agreement with Statements about the Program**

Statement	Strongly Disagree	Disagree	Agree	Strongly Agree	Do Not Know	Mean
	1	2	3	4		
Students in my classroom have developed deeper interest in science because of the curriculum kits.	0%	6%	48%	44%	1%	3.38
Students in my classroom have developed deeper understanding of science because of curriculum kits.	0%	6%	61%	30%	2%	3.24
I feel more confident in my knowledge of science content because of the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	0%	14%	62%	21%	3%	3.07
I feel more confident in teaching science content because of the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	0%	13%	67%	18%	2%	3.05
My school now places more emphasis on science instruction in the school overall because of its involvement in the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	0%	10%	56%	32%	2%	3.23
In my classroom, I place more emphasis on integrating literacy into science instruction because of my involvement in the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	1%	17%	61%	17%	3%	2.96
My school now places more emphasis on integrating literacy into science instruction in the school overall because of its involvement in the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	1%	14%	63%	15%	7%	2.99
Parents/guardians of my students are more interested in their children's achievement in science because of the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	5%	38%	29%	5%	23%	2.44
Parents/guardians of my students are more interested in their children's achievement in language arts because of the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	5%	44%	22%	5%	24%	2.35
Parents/guardians of my students are more interested in their children's achievement in literacy as it relates to science because of the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	6%	42%	24%	2%	26%	2.29
Parents/guardians of my students are more interested in "writing across the curriculum" literacy activities because of the <i>Literacy Enriched Science Through Guided Inquiry – Elevated Thinking and Knowledge Program</i> .	6%	45%	18%	3%	27%	2.22

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**Table 2: Respondents’ Level of Agreement with Statements about Student Learning Through the Use of the Curriculum Kits**

Statement	Strongly Disagree 1	Disagree 2	Agree 3	Strongly Agree 4	Do Not Know	Mean
The curriculum kits improve students’ abilities to identify problems/questions to be solved.	0%	7%	79%	14%	0%	3.08
The curriculum kits improve students’ abilities to observe phenomenon.	0%	7%	64%	29%	0%	3.22
The curriculum kits improve students’ abilities to collect information/data.	0%	1%	66%	33%	0%	3.32
The curriculum kits improve students’ abilities to organize information/data.	0%	6%	67%	27%	0%	3.21
The curriculum kits improve students’ abilities to analyze information/data.	0%	2%	74%	23%	1%	3.21
The curriculum kits improve students’ abilities to formulate solutions to problems.	0%	5%	78%	16%	1%	3.12
The curriculum kits improve students’ abilities to support claims with evidence.	0%	3%	69%	27%	1%	3.24
The curriculum kits improve students’ abilities to defend an argument.	0%	11%	72%	14%	2%	3.02
The curriculum kits improve students’ abilities to retain an understanding of vocabulary.	0%	3%	72%	25%	0%	3.22
The curriculum kits improve students’ abilities to correctly use vocabulary.	0%	6%	67%	27%	0%	3.22
The curriculum kits improve students’ abilities to communicate orally.	0%	6%	65%	25%	4%	3.20
The curriculum kits improve students’ abilities to communicate in written form.	0%	15%	68%	15%	2%	3.00
The curriculum kits improve students’ abilities to work productively in groups.	0%	7%	64%	29%	0%	3.22
The curriculum kits improve students’ abilities to work with their peers to achieve common goals.	0%	6%	70%	23%	1%	3.17
The curriculum kits improve students’ abilities to integrate mathematics and science content.	0%	15%	67%	17%	1%	3.02
The curriculum kits improve students’ abilities to apply existing mathematics knowledge/skills.	0%	18%	64%	11%	7%	2.93
The curriculum kits improve students’ abilities to connect new information with prior knowledge.	0%	4%	67%	28%	0%	3.24
The curriculum kits improve students’ abilities to direct their own learning.	1%	13%	63%	20%	2%	3.05
The curriculum kits improve students’ abilities to assess the quality of their own work.	1%	20%	60%	12%	7%	2.90
The curriculum kits improve students’ knowledge of fundamental scientific content.	1%	3%	72%	24%	0%	3.18

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For more information, please contact:

*Paul J. Ainslie, Ph.D.*

Managing Director, I-STEM Resource Network

Purdue University

Mann Hall B041

203 S. Martin Jischke Dr.

West Lafayette, IN 47907