

TEACHER IMPACT GOALS STRATEGIC AREA OF FOCUS #1

Our first strategic goal was to provide our teachers with rich professional development regarding New York State Science Learning Standards, formatting new science curriculum maps, uniform lesson structure, and STEM-based inquiry labs and experiments. Providing teachers with this professional development through the guidance of our lead science teachers served to strengthen our science program.

TEACHER IMPACT GOALS STRATEGIC AREA OF FOCUS #2

The second goal was to provide our elementary students with innovative STEM equipment required to enrich their participation in engineering lessons and projects.

Elwood School District

Harley Avenue Primary School (Greenlawn, New York) & James H. Boyd Intermediate School (Huntington, New York)



Engineering Design Standards

OVERVIEW

The title of our Teacher Impact Grant was “Teaching STEM Through Professional Learning Communities” which supported the adoption of the New York State Science Learning Standards. This grant was of impact to both our primary and intermediate schools. Between the Harley Avenue Primary School and the James H. Boyd Intermediate School, this grant served approximately 950 students. With the adoption of these rigorous science standards, classroom teachers across multiple grades began the work to align the standards during a curriculum-writing pilot in July 2016, and professional development for this work continued throughout the course of the year. Our district develops curriculum through professional learning communities, which impact 40 classroom teachers for grades K–5. Six classroom teachers were awarded the role of lead science teacher; the role served to steward the vision for the professional development for this project. As of July 2017, we are developing lessons and units aligned to the standards and creating a districtwide curriculum map for full implementation planned to begin in September. Our vision to implement a STEM curriculum is vital to the future of our students, our district, and our country.

THE CHALLENGE

What was the challenge you were facing? What goals were you trying to achieve?

It was an incredible challenge to find high-quality professional development for our elementary school teachers. Our grant titled “Teaching STEM Through Professional Learning Communities” supports the adoption of the New York State Science Learning Standards. Our first goal was to provide our teachers with rich professional development regarding New York State Science Learning Standards, formatting new science curriculum maps, uniform lesson structure, and STEM-based inquiry labs and experiments. This was the most challenging goal to achieve. The second goal was to provide our elementary students with innovative STEM equipment required to enrich their participation in engineering lessons and projects. We received the materials for this goal early on in the grant process.

Summarize three points of frustration you faced.

There were several points of frustration during the project. The first frustration was finding high-quality professional development for STEM geared toward elementary teachers. Initially, our lead science teachers were enrolled in engineering coursework through the Engineering the Future program. After receiving the syllabus, it was evident that the coursework was for secondary educators. We withdrew from the coursework and began a search for professional development geared toward elementary educators. The second frustration was time. Our professional development meetings are 40 minutes during the school day, once a week, per grade level. Teacher assistants cover classroom teachers’ classes, but more often than not, these sessions have been canceled due to a lack of coverage. Also, these professional development sessions are shared between all elementary subject areas. The third frustration has been guiding lead science teachers in STEM lesson planning. At our initial planning session, we created Google folders for STEM activities. However, teachers needed to read professional literature and lesson templates prior to creating these activities.

What strategies were you attempting to use before to solve this problem?

High-Quality Professional Development: After a great deal of research, we found another company called Engineering Is Elementary. However, the director and I realized that the foundation of their program would require purchasing additional STEM kits. This was simply not a viable option. Continued research led us to two incredible solutions: The Hall of Science and Discovery Education. Our lead science teachers went to the Hall of Science for training of STEM-building activities geared towards elementary school. Additionally, they attended a course through Discovery Education. *Time:* Relying on the well-intended professional development meetings as a consistent time to discuss STEM was unrealistic. So instead, we met before and after school and scheduled time at a faculty meeting to give STEM updates.

Guiding Teachers: Although teachers had applied for and were selected to be lead science teachers, it took some convincing that the vision for STEM was an imperative shift in science instruction. Also, it was evident that there was a gap in leadership expectations, sustaining change, and productivity.



ELWOOD SCHOOL DISTRICT

This project was intended to have an impact our district in our primary and intermediate schools:

James H. Boyd Intermediate School
Harley Avenue Primary School

- Huntington, NY
- Suburban
- 950 students
- Grades K–5

Demographics:

Hispanic/Latino 15%
Asian 9%
White 68%
Multiracial 2%

Other Groups:

Economically Disadvantaged 22%
Students with Disabilities 11%
English Language Learners 4%

What was the big “aha” moment when you decided you needed to try something new?

Throughout the duration of the grant work, I have been very reflective after each email, planning session, and meeting we have had. It takes constant reflection to be clear about how we are meeting our goals for the project. When I discussed my frustrations with my director and building principal, we explored how to navigate imposed structures with teachers through collaborative leadership and explicit expectations. This was a big “aha” moment for me.

What was the top reason you selected this grant?

It was a professional decision to become a member of ASCD. In being a member, I had learned about the grant through an email. The vision and expectations of the grant were symbiotic with my beliefs as an educator and administrative intern. Additionally, I believed in the STEM initiative and in the concept of teachers as leaders. My primary reason for selecting this grant was to afford our district financial leverage to promote the STEM initiative for our students and teachers.



THE RESPONSE

How has the Teacher Impact Grant work helped you achieve your goals or solve a problem?

Our first goal was to provide our teachers with rich professional development regarding New York State Science Learning Standards, formatting new science curriculum maps, uniform lesson structure, and STEM-based inquiry labs and experiments. This was the most challenging goal to achieve, and it is still a work in progress because there is still much to learn in the paradigm shift we are experiencing, as a country, in science. The second goal was to provide our elementary students with innovative STEM equipment required to enrich their participation in engineering lessons and projects. This goal was achieved with the inception of the grant and has motivated other teachers in participating, publicizing, and even working on additional grants to fund STEM and a makerspace.

How has it impacted your school/district/teachers/principals/students?

This grant has affected our district by continuing to support the fine work toward the district vision for a focused future. Administrators have been fully supportive in the delivery of several meaningful professional development opportunities for our elementary teachers. This summer, the district implemented the start of an aligned scope and sequence for science for grades K–12, in which two teachers will begin unit planning to match the New York State Science Learning Standards. Teachers at the elementary level will still need additional professional development in the upcoming school year to navigate the standards with lesson development in order to align to the performance outcomes, specifically in the planning and depth of knowledge of engineering lesson structure and design. The student experience has been most beneficial in that students thrive on STEM activities and engineering lessons. These lessons and activities not only support our student’s kinesthetic learning modalities, but also demonstrate a level of universal engagement that is not always observable in the other subject areas.

How has it helped you to overcome the challenges you had before?

Prior to the inception of the grant, there was a professional development gap and not a definitive focus on giving elementary teachers guidance in developing STEM activities. At the close of this school year, teachers and students have grown in embracing this initiative.

STEM in Action



Earthquake Technologies Challenge

Science Standards in Action

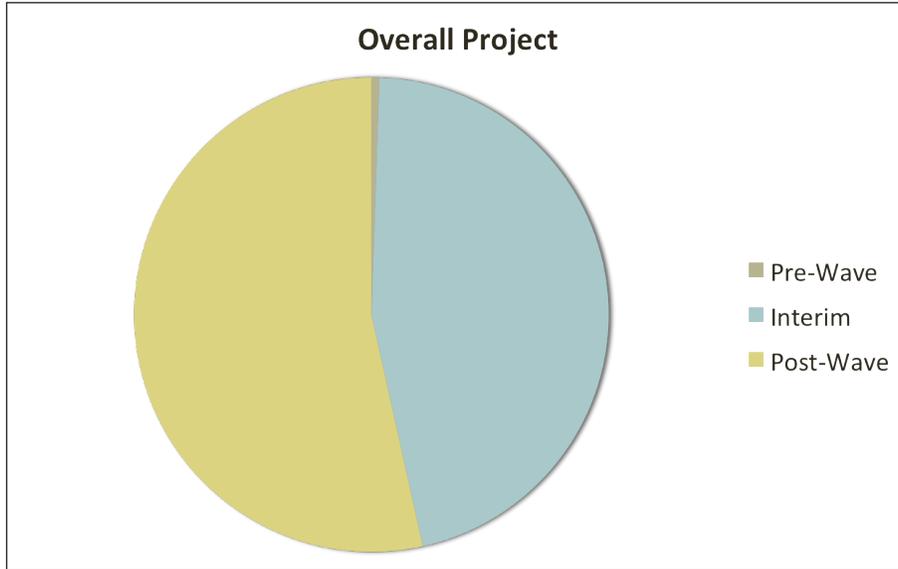


*Sheep in a Jeep
STEM Science Labs*

THE RESULTS

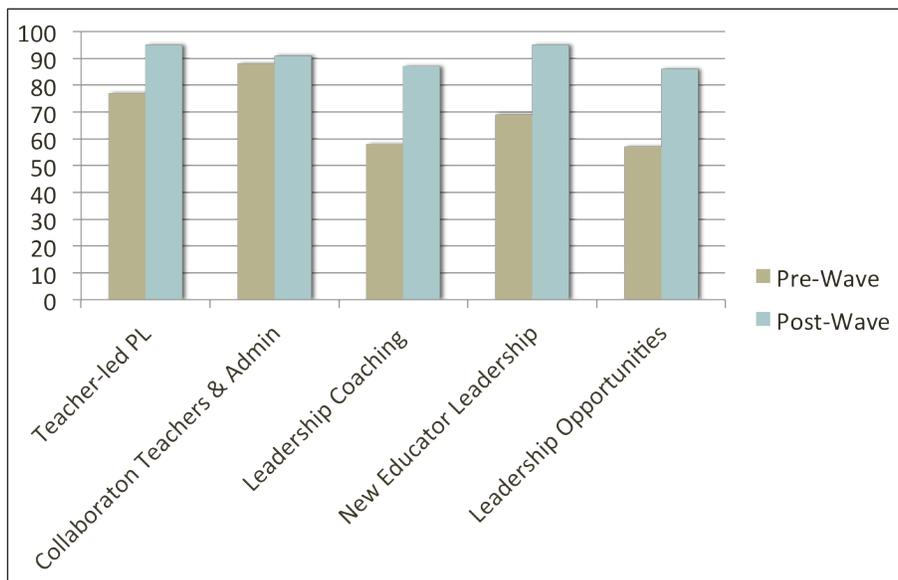
What specific metrics can you share about the impact it had (having data for a graph/chart/figure or two is greatly preferred)?

(Fig. 1 of 2)



This is a chart for the overall project titled, "Teaching STEM Through Professional Learning Communities." The data for the overall rating of this project was 0% for the pre-wave, 86% for the interim, and 100% for the post-wave survey.

(Fig. 2 of 2)



This data was collected from the pre- and post-wave survey regarding the impact the grant had on the teachers in our district. The first category was "Teacher-led professional learning," 77% pre- to 100% post-wave. The second category was "Collaboration among teacher leaders and administration on professional learning," 88% pre- to 99% post-wave. The third category was "Leadership coaching for teachers," 58% pre- to 100% post wave. The fourth category was "New educators being provided with leadership opportunities," 69% pre- to 100% post wave. The fifth category was "Leadership opportunities being used to recruit educators," 57% pre- to 93% post wave. The results demonstrate significant growth as a result of the Teacher Impact Grant.

**What is the single biggest reason you would recommend applying for a Teacher Impact Grant in the future?**

The single most important reason I would recommend applying for a Teacher Impact Grant in the future would be for the depth of professional growth it has instilled in my colleagues and me. This project could not have come to fruition without the support of the superintendent, Dr. Kenneth Bossert, and the Director of Science, Math, and Technology, Ms. Eileen Kelley. Ms. Kelley worked closely with me throughout the entire course of the grant and has guided the teachers in adopting and most importantly enjoying this new, yet challenging, work.

CALL TO ACTION**Professional Learning**

As team lead, I conducted the initial professional learning experience for teachers regarding the goals of the grant and the movement of STEM for the Lead Science Teachers. Additionally, the Director of Science, Math, and Technology scheduled grade-level and faculty meetings where I could continue to share the vision for STEM and the district goals surrounding this project. Lead Science Teachers conducted professional development for teachers on their grade level. The professional learning opportunities included teacher-developed STEM activities and the STEM kits that we received from the grant.

Partnerships

The Director of Science, Math, and Technology and building principals were very supportive of the project throughout the course of the grant. Administrators helped to field pragmatic questions and the implementation of STEM kits into our current science program. Additionally, teachers were afforded the leisure to schedule their own time in giving these professional learning opportunities to their students.

Student Learning

All teachers embraced the movement of our STEM initiative because they knew it would engage students in the learning process. The deeper the teachers embraced the initiative, the greater impact it had on their students in the classroom. Students participated in a multitude of STEM activities, as well as the lessons from the new STEM kits, throughout the year. The students in both our primary and intermediate schools also participated in "A Day of STEM" with teacher-created lessons and activities facilitated by the New York City Hall of Science.

Teacher Leadership

This project supported sustained teacher leadership because our administration believes in teacher leaders. The Lead Science Teachers for this project did a stellar job, and according to the results from the survey, perception of teacher leadership in the district grew from 77 percent to 100 percent. Professional development needs to be at the forefront of such an initiative, which is why I truly embrace the theory of teacher leadership.

Growth

I have experienced much growth as a teacher leader. True teacher leadership is a delicate combination of vision, perseverance, and humility. Teaching teachers is much like teaching students in that engaging your audience is key. Guidance from administrators and positive feedback to colleagues is essential in such a project. Taking a federal educational movement, such as STEM, and instilling this vision into the minds and practice of our teachers was rewarding.

Leading Teachers in STEM

*Engineering Principles
The Marshmallow Challenge*

Reflection

There is still much work to be done for the STEM movement in our district. Elementary school teachers still have varying levels of proficiency when it comes to the engineering component of STEM lessons. This will be a learning curve for educators, not merely in our district, but throughout the country. Standards often look impressive on paper, but when it comes to real-world implementation there is always a learning curve for educators and for students. One of the comments from a teacher in the post-wave survey about a challenge we faced was, "Time is always a challenge." This is true far too often in education as we continue to add initiatives without adding time to our school calendar. This summer, teachers throughout the district will be aligning curriculum to the New York State Science Learning Standards. We recognize that we have done some amazing work through the grace of this grant and look forward to the continuation of the STEM movement in the months and years to come.

Engineering Standards in Action

Bridge Design

A Focused Future

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