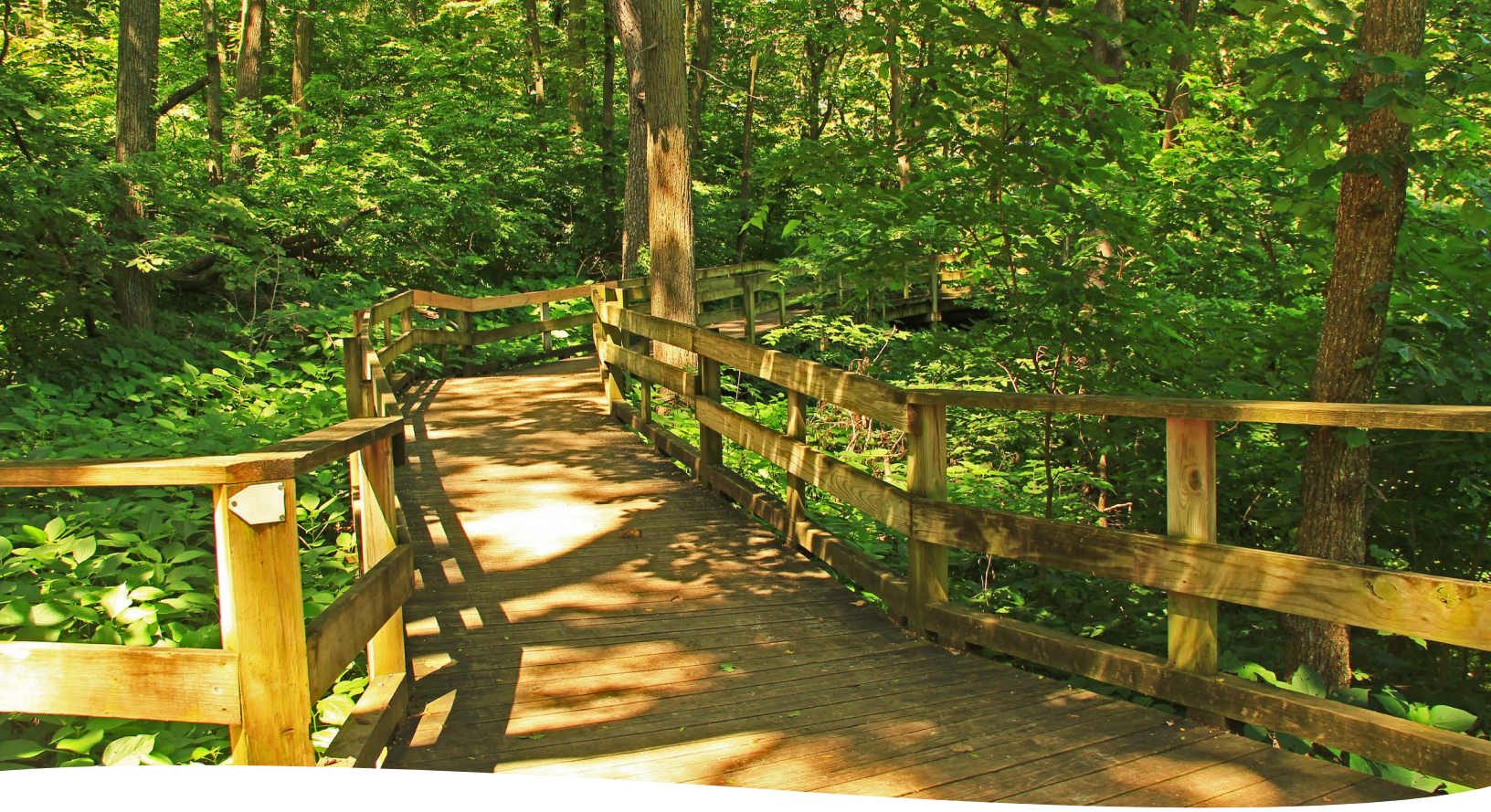

EDUCATION

Bellevue Public Schools Project STEM Insights on the Discovery Education Partnership Year 2

Project STEM Overview

Bellevue Public Schools (BPS), located in eastern Nebraska, instituted *Project STEM (Student, Teacher, Engaging Minds)*, a five-year program to expand STEM opportunities for military-connected elementary school students with a $1.25 million grant from the Department of Defense Education Activity (DoDEA). The district serves a large number of military-connected families due to its proximity to Offutt Air Force Base. The goal of *Project STEM* is to increase student achievement in math and science across all elementary schools within the district.[1] DoDEA funding supports operations at 9 elementary schools with high concentrations of military-connected, and the district is funding extension of the program across the remaining 6 elementary schools. The program was planned during the 2018-19 school year (Year 1), implemented in 2019-20 (Year 2) and is scheduled for completion at the end of the 2022-23 school year.

The *Project STEM* DoDEA grant program goals were to increase math and science outcomes among military-connected students on state assessments. The Spring 2023 targets for the average proficiency rate among military-connected students are 65.5% for math and 79.3% for science. The Spring 2023 targets were set in relation to the baseline, Spring 2019, in which the proficiency rates were 59.5% for math and 73.3% for science.[2]

[1] "Bellevue Public Schools Receives 1.25 Million DoDEA STEM Grant for Elementary Schools." Bellevue Public Schools. Retrieved from URL.

[2] Lovin, P. & Carruthers, W. (2020, October). *Students and Teachers Engaging Minds to Improve Achievement in Math and Science: Project STEM DoDEA Annual Report: Year 2-Implementation*. Garner, NC. Grant*Prose*, Inc, p. 5.

BPS identified three strategies from a menu provided by DoDEA to meet the grant's program goals: in-class curriculum support, in-class technology support, and extra-curricular activities. The district partnered with Discovery Education and Edmentum, a provider of mathematics technology, to meet these goals. The Discovery Education partnership includes a three-year professional learning series for four teachers and an administrator from each school to develop a STEM Leader Corp, along with schoolwide access to Discovery Education digital resources, STEM Connect and Discovery Streaming Plus, across all 15 elementary schools.[3]

Grant*Prose*, Inc. was contracted to conduct an independent program evaluation of the *Project STEM* grant. Grant*Prose* produced a report on Year 2 implementation and another report comparing staff attitudes toward STEM instructional practices from 2019 and 2020 surveys. This document summarizes key insights from both reports.

Year 2 Implementation Progress

Despite the disruption to the academic year due to the pandemic, BPS was able to continue STEM instruction for students both virtually and in-person. Virtual summer school included daily STEM instruction. STEM instruction is provided in both in-person and virtual school during the 2020-21 school year, Year 3 of the program.

As of fall 2020, there were 1,141 military-connected students enrolled at the 9 schools receiving grant funding, representing 33.8% of enrollment across these schools. All of these students were expected to be impacted by *Project STEM*.[4]

According to the Grant*Prose* Year 2 implementation report, BPS set and met the following milestones for implementation:

- BPS regularly communicated with stakeholders.
- BPS staff at targeted schools led *Project STEM* activities and supports.
- BPS provided professional learning through its contracts with Discovery Education and Edmentum.
- BPS worked with Grant*Prose* to implement the evaluation plan.[5]

Discovery Education was able to deliver much of the planned professional development in person prior to the COVID-19 crisis, but in-person sessions were canceled in the spring. STEM Leader Corp Training Session 1 was held on August 26-27, 2019, Session 2 on October 28-29, 2019, Session 3 on December 17-18, 2019, and Session 4 on February 10-11, 2020. Discovery Education provided in-class coaching for STEM Leader Corp teachers monthly throughout the 2019-20 school year. A half-day professional learning session for elementary administrators including principals, instructional coaches, and district technology staff was held on October 2, 2019. Coaching sessions for each school's administrative team were held in the fall (September-November 2019) and spring (January-March 2020).[6]

Progress toward annual student achievement targets on state assessments was not measured in Year 2 because the state assessments were canceled due to COVID-19.

Staff Attitudes, Beliefs and Opinions Toward STEM Instruction

BPS staff were surveyed multiple times throughout 2019 and 2020 to assess their impressions of Discovery Education professional development, attitudes toward STEM instructional practices among STEM Leader Corp participants, and attitudes toward STEM instructional practices among the general teacher population.

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[3] "Bellevue Public Schools Receives 1.25 Million DoDEA STEM Grant for Elementary Schools." Bellevue Public Schools. Retrieved from URL.

[4] Lovin, P. & Carruthers, W. (2020, October). *Students and Teachers Engaging Minds to Improve Achievement in Math and Science: Project STEM DoDEA Annual Report: Year 2-Implementation*. Garner, NC. Grant*Prose*, Inc, p. 3.

[5] Lovin, P. & Carruthers, W. (2020, October). *Students and Teachers Engaging Minds to Improve Achievement in Math and Science: Project STEM DoDEA Annual Report: Year 2-Implementation*. Garner, NC. Grant*Prose*, Inc, p. 1.

[6] Ibid.

Impressions of Discovery Education Professional Development

Six surveys were administered by October 2020 to understand participant impressions of the Discovery Education professional development program. These surveys revealed generally positive views of the program with most responses between Agree and Strongly Agree on a five-point Likert scale, as shown in Table 1, below.[7]

Table 1. Impressions of Discovery Education Professional Development Programs

Date of Survey	8.19	10.19	12.19	2.20	9.20	10.20
# Respondents	57	49	51	18	40	52
I am satisfied with the professional learning offered in this program.	4.25	4.43	4.36	4.72	4.31	4.35
The program content and strategies will be useful in my work.	4.37	4.45	4.40	4.83	4.31	4.46
The materials and resources provided will be useful in my work.	4.46	4.45	4.44	4.78	4.43	4.44
I am confident I can implement what I learned this session in my work.	4.26	4.37	4.34	4.67	4.40	4.29
I plan to implement what I learned this session in my work.	4.32	4.43	4.38	4.61	4.41	4.35

Adapted from: Carruthers, W., & Lovin, P. (2020, October). *Comparing BPS Staff Members' Attitudes, Beliefs and Opinions Towards STEM Instructional Practices on 2019 and 2020 Surveys.* Garner, NC: Author.

Surveys of BPS STEM Leaders

Grant*Prose* surveys were administered to each school's STEM Leader Corp in May of 2019 and 2020 to understand teacher perceptions related to STEM instructional practices. Results represent responses from 36 teachers in May 2019 and 32 in May 2020. Salient findings include the following:

- Teachers indicated they were integrating STEM activities into their lessons more often in 2020 than in 2019.
- Teachers were asked to rate their abilities to teach math, science, engineering and technology as Strong(4), Adequate (3), Weak (2), or Poor (1). The ratings for all four subjects improved on the 2020 survey.
- Surveys constructed by the Friday Institute of Educational Innovation at NC State University and implemented by Grant*Prose* showed increases in teacher efficacy and attitudes toward the STEM disciplines on the 2020 survey.[8]

General Teacher Population Surveys

Grant*Prose* administered surveys to teachers of Grades K-6 in September 2019 (193 respondents) and again in September 2020 (174 respondents) to understand teacher attitudes, beliefs, and opinions about STEM instructional practices. The 2020 survey included additional items to understand how the pandemic impacted science and math instruction.

- When asked about how they defined teaching STEM, there was a 9-point gain for "teaching thinking skills."
- The frequency of integrating STEM activities in the classroom increased, with the response of "a few times a week" increasing from 23.2% to 31.4% and the response "less than once a month" decreasing from 14.6% to 6.8%.
- There was a slight but consistent improvement in self-reporting of abilities to teach the four STEM content areas.

- There was a slight increase in staff report of self-efficacy teaching both math and science.
- Teachers reported greater uses of technology in 2020 than in 2019 across a variety of contexts including: use of a variety of technologies, use of technology for communication and collaboration; use of technology to access online resources, work on technology-enhanced projects that approach real-world applications; use of technology to solve problems; use of technology to support higher-order thinking skills; and use of technology to create new ideas and representations.
- Teachers reported that students are incorporating STEM thinking skills in their work at higher rates in 2020 than in 2019 across the following areas: develop problem-solving skills through investigations; make predictions that can be tested; make careful observations or measurements; use tools to gather data; recognize patterns in data; create reasonable explanations of results of an experiment or investigation; create reasonable explanations of results of an experiment or investigation; and choose the most appropriate methods to express results.[9]

Impact of COVID on Instruction

Teachers reported that COVID-19 had an adverse impact on math and science instruction. Grant*Prose* reported common problems cited by the teachers included challenges with "…collaboration, small groupwork, handling manipulatives and sharing access to instructional materials…"[10]

Conclusions and Reccomendations:

The Grant*Prose* survey report includes a conclusion that states that BPS staff "…have consistently given Discovery Education high marks for its professional development programs, members of the STEM Leaders Team evidence strong attitudes, beliefs and opinions towards STEM instruction in the 2020-21 year relative to the 2019-20 year, as does the general teacher population. It is especially notable that both the STEM Leaders Team members and the general teacher population report more frequently integrating STEM instructional activities in their weekly curriculum.[11]

In the Year 2 evaluation, Grant*Prose* recommended that BPS continue to provide Discovery Education STEM Connect, professional learning activities for building administrators and teacher leaders, and classroom coaching for STEM Leader Corps teachers during the 2020-21 school year.[12]

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[7] Carruthers, W., & Lovin, P. (2020, October). *Comparing BPS Staff Members' Attitudes, Beliefs and Opinions Towards STEM Instructional Practices on 2019 and 2020 Surveys. Garner, NC: Author., p. 2*

[8] Carruthers, W., & Lovin, P. (2020, October). *Comparing BPS Staff Members' Attitudes, Beliefs and Opinions Towards STEM Instructional Practices on 2019 and 2020 Surveys.* Garner, NC: Author., p. 7

[9] Carruthers, W., & Lovin, P. (2020, October). *Comparing BPS Staff Members' Attitudes, Beliefs and Opinions Towards STEM Instructional Practices on 2019 and 2020 Surveys.* Garner, NC: Author., pp. 9-12

[10] Carruthers, W., & Lovin, P. (2020, October). *Comparing BPS Staff Members' Attitudes, Beliefs and Opinions Towards STEM Instructional Practices on 2019 and 2020 Surveys.* Garner, NC: Author., p. 12

[11] Carruthers, W., & Lovin, P. (2020, October). *Comparing BPS Staff Members' Attitudes, Beliefs and Opinions Towards STEM Instructional Practices on 2019 and 2020 Surveys.* Garner, NC: Author., pp. 14-15

[12] Lovin, P. & Carruthers, W. (2020, October). *Students and Teachers Engaging Minds to Improve Achievement in Math and Science: Project STEM DoDEA Annual Report: Year 2-Implementation.* Garner, NC. Grant*Prose*, Inc, p. 5.