

2018-19 Evaluation of Rigorous Interactive Teaching & Learning in Science

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At-a-Glance

The Dallas Independent School District (Dallas ISD) Science, Technology, Engineering, and Mathematics (STEM) Environmental Education Center (EEC) is a 500-acre academic facility located in Seagoville, TX. The center offers district teachers and students the opportunity to connect with nature while learning science content and skills. EEC programs are fully aligned to the Texas Essential Knowledge and Skills (TEKS) for Science. Students planned and implemented both laboratory and field investigations during science instruction.

The purpose of the EEC was to help district students develop an awareness, appreciation, and concern for the environment; to use acquired knowledge to make informed, responsible decisions; and to solve environmental problems.

How was the EEC program funded?

As obtained through workscope review and through conversations with Special Revenue Funds Management staff members, the total funding for the EEC in 2018-19 was \$174,832 from Title I, Part A, which was an increase from the 2017-18 budget of \$149,118. These funds covered personnel, contracted services, and supplies and materials.

What programs and services did the EEC provide in 2018-19?

Methodology

Program documents and participation data were obtained from the EEC program manager. The evaluator also reviewed the EEC website.

Results

The EEC provided a variety of programs and services to Dallas ISD students from kindergarten through high school. Some of these services included:

- experienced teachers, naturalists, and volunteers to work with visiting teachers and students;
- over 500 acres of Texas landscape to explore through guided field investigations;
- three nature trails: The Post Oak Preserve Trails, The Old Field Trail, and The Big Ponds Trail;
- Habitat Hall, a 26,000 square foot facility featuring world ecosystems, plant and animal facts, prairie, forest, creek and pond habitats, and a fossil study area;
- four science laboratories with equipment for environmental field studies;
- a 70-seat ecology theater;

- a working barn with a variety of livestock for students to observe, learn about, and feed;
- live amphibians, reptiles, mammals, and birds for observation and study;
- a fossil collection for observation and study;
- vegetable, flower, and herb gardens;
- an astronomical observatory with telescopes, binoculars, and other astronomy equipment; and
- a Full Dome Reality Planetarium.

Table 1 provides program information by grade level.

Table 1: 2018-19 EEC Programs by Grade Level

Grade	Programs
PreK	Amazing Animals; Forest Walk; Seasons and Weather
K	All About Animals; Discover Water, Weather, and Wildlife; Trees from Tiny to Gigantic; Secrets of the Woods and Meadows
One	Mammals and More; Signs of the Seasons; Forest Food Chain; Sensational Seeds
Two	Amazing Arthropods; How's the Weather? Our Green World; Web of Life Discovery Walk
Three	Discover the Woods and Meadows Ecosystems; Exploring Our Solar System; Feathered Friends; Get the Dirt on Soil, Weather, Water, and Wildlife
Four	Down and Dirty, Forest Ecosystem Investigation; Meet the Critters-Reptiles and Amphibians, Our Green World; Sensing the Future (Weather Forecasting); Water, Water, Everywhere
Five	Birds-Structures, Functions and Niches; Exploring the Sun, Earth and Moon System; Fossils: A Clue to the Past; Leaf Litter Detectives; Meet the Critters-Predators and Niches; Our Changing World, Pond Ecology; Walking with Wonder-The Forest Revealed; Weather and Climate
Six	All Things are Connected-Interdependence in the Woods; Grassland Ecology; Here Comes the Sun; Interacting with Reptiles and Amphibians, Limnology-Ecology of a Freshwater Pond; Rocks and Minerals, Taxonomic Groups and Volcanoes
Seven	Animal Adaptations-Birds; Animal Adaptations-Reptiles and Amphibians; Compost Happens, Forest Ecology-Post Oak Preserve Trail Walk; Grassland Ecology; Limnology-Ecology of a Freshwater Pond; Texas Land and Water-Blackland Prairie
Eight	Animal Adaptations-Birds; Exploring the Sun, Earth, and Moon System; Forest Ecosystems, Freshwater Pond Ecosystem; Plate Tectonics, Reptiles and Amphibians-A Unique Group; Understanding Climate and Weather
High School	Unique Group-Reptiles and Amphibians; Birds-Adaptations and Ecology; Forest Ecology; Freshwater Pond Ecology, Grassland Ecology; Limnology of the Freshwater Pond

Source: Data from EEC staff members December 11, 2018.

Note: K = kindergarten. PreK = prekindergarten. EEC = Environmental Education Center.

How was the EEC implemented?

The evaluator conducted an on-site observation and an interview with the program manager on December 11, 2018 to find out successes and challenges of EEC implementation and to plan for attendance data collection for the 2018-19 school year.

Some EEC facilities were successfully updated for 2018-19, including an update to auditorium facilities and some electronic devices for a cost of \$24,869, and an update to Habitat Hall for a cost of \$4,334.¹

Program management was challenged by some teachers neglecting to notify the EEC when field trips were canceled, resulting in wasted efforts, wasted materials, and wasted money for unneeded bus transportation planned for the visit.

The EEC encouraged teachers and students to visit the center each year. Table 2 displays the number of visiting students and adults from 2016-17 through 2018-19. The total number of visitors increased by 6,874 (29%) since 2016-17.

Table 2: 2016-17 to 2018-19 Number of Students and Adults Who Visited the EEC

	2016-17	2017-18	2018-19
August	0	0	0
September	1,940	1,227	1,174
October	3,451	3,059	2,784
November	2,209	2,095	2,118
December	1,378	1,217	1,126
January	873	1,845	2,187
February	1,924	2,589	2,799
March	2,349	1,825	2,602
April	3,599	2,752	3,129
May	3,657	3,317	2,472
June	125	125	125
Planetarium field trips	214	232	337
Outreach/tutoring	2,009	8,561	9,737
Camping	113	94	125
Total visitors	23,841	28,938	30,715

Source: Data from EEC staff members dated June 15, 2017 (2016-17), December 15, 2018 (2017-18), and June 06, 2019 (2018-19).

Note: Attendance includes students, teachers, and chaperones. Numbers shown for the astronomy field trips, outreach/tutoring, and camping are not included in the monthly numbers shown. EEC = Environmental Education Center.

Students and teachers were invited to participate in EEC-sponsored events, such as The Sun and the Stars, Our Place in Space, Solar Eclipse Party, STEM Night, EEC Open House, Science Night, and Getting Over Your Gears. Students and teachers also enjoyed access to the astronomical observatory to use telescopes, binoculars, and other astronomy equipment. Table 3 shows the number of students and

teachers who visited the planetarium in 2018-19 and the total number of teachers who visited the Center and the Planetarium.

Table 3: 2018-19 Number of Students and Teachers Who Visited the EEC Planetarium by Semester

Semester	Students N	Teachers	
		Visited Planetarium N	Visited Center N
Fall 2018	115	22	722
Spring 2019	222	277	2,472
Total	337	299	3,194

Source: EEC department data files dated December 11, 2018 (fall) and June 06, 2019 (spring).

Note: EEC = Environmental Education Center.

The Living Materials Request (LMR) was another service the EEC provided to district science teachers from prekindergarten through grade 12. Teachers submitted service requests two weeks in advance of needing materials. The EEC supplied live specimens and materials including terrestrial plants (e.g., moss, fern), aquatic plants (e.g., duckweed, elodea), seeds, microorganisms (e.g., bacteria, algae), invertebrates (e.g., vinegar eels, land snails, earthworms, crickets) and other materials (e.g., potting soil, peat pots). Table 4 summarizes the number of times LMR services were provided to campuses by campus level.

Table 4: 2017-18 and 2018-19 Number of Campuses and Classrooms That Submitted Living Materials Requests to EEC by Campus Level

Campus Level	Campuses N	Classrooms N
	2017-18	2018-19
Elementary School	115	1,229
Middle School	12	418
High School	23	358
Total	150	2,005
2018-19		
Elementary School	113	1,314
Middle School	6	17
High School	12	195
Total	131	1,526

Source: EEC department data files received June 06, 2019.

Note: EEC = Environmental Education Center.

Were teachers satisfied with the living materials request service?

Methodology

To collect feedback regarding living materials services provided, EEC staff members sent online surveys to teachers who had requested living materials services throughout the school year. Survey questions asked

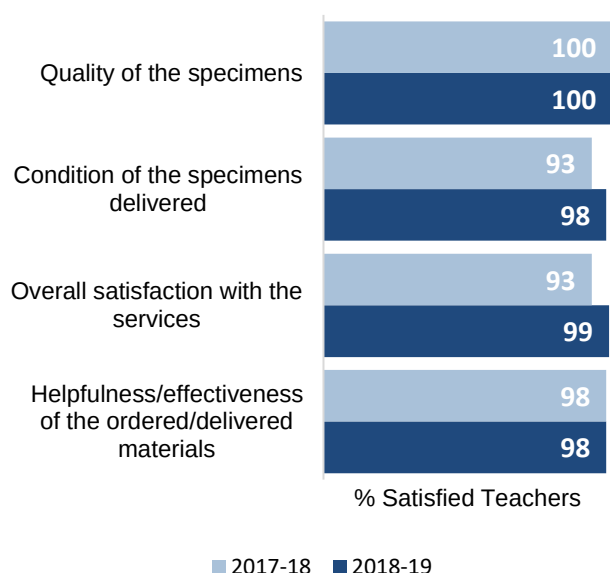
¹ Funds for updates were provided by the STEM Mathematics and Science Departments.

teachers to rate the living materials services provided by EEC on a scale of one (not satisfied) to five (very satisfied). A total of 245 out of 272 teachers invited completed the survey (90% response rate). EEC staff members shared the data with the evaluator, who conducted frequency analyses to calculate the rate of teachers who indicated they were satisfied (rated four or five) with each aspect of service.

Results

As shown in Figure 1, teachers indicated a high level of satisfaction with the quality of specimens and with living materials services (range: 98% to 100%). This high satisfaction was consistent or higher than the previous year, including a six-percentage point increase in overall satisfaction with services from 2017-18.

Figure 1: 2018-19 EEC Living Materials Request Teacher Satisfaction Survey (N = 245)



Source: EEC department data files dated May 10, 2019.
Note: EEC = Environmental Education Center.

Were teachers satisfied with field trips to the EEC?

Methodology

To collect feedback about field trips, the EEC sent online surveys throughout the year to teachers whose classes had attended field trips at the EEC during 2018-19. The evaluator used frequency analyses to summarize the results.

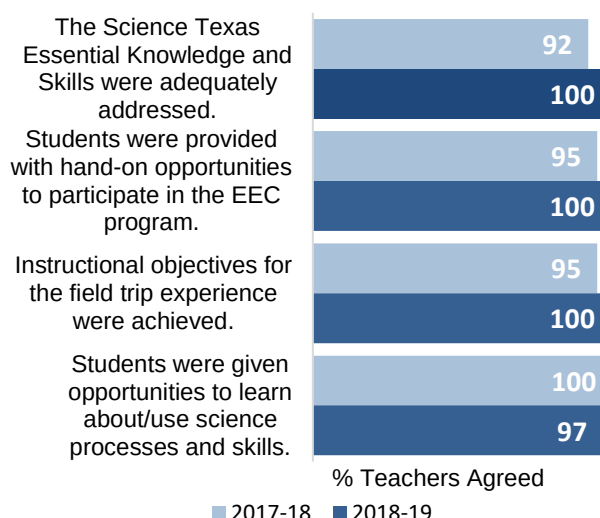
A total of 193 of 196 surveyed teachers (98% response rate) completed the survey. Survey questions asked teachers to rate agreement with four statements regarding their experiences with EEC field trips on a scale of one (completely disagree) to five (completely

agree). EEC staff members shared the data with the evaluator, who conducted frequency analyses to calculate the rate of teachers who indicated agreement (rated four or five) with each statement.

Results

As shown in Figure 2, at least 97 percent of teachers responded positively to all statements, indicating a high level of satisfaction with EEC field trips. This high level of agreement continued from one year ago, with teachers expressing a slightly higher level of agreement with most statements.

Figure 2: 2018-19 EEC Field Trip Teacher Satisfaction Survey (N = 196)



Source: EEC department data files dated May 10, 2019.
Note: EEC = Environmental Education Center.

How was the 2018 summer science enrichment program implemented?

Methodology

The evaluator obtained documents from EEC program staff members outlining the activities and attendance records for the summer science enrichment program. The evaluator summarized program and attendance information by the three types of camps offered by the EEC in summer 2018.

Results

The three-week Summer Science Enrichment program was held from June 4 to June 22, 2018. Program classes were held five days a week, Monday through Friday, from 9 a.m. to 3 p.m. Breakfast, lunch, and transportation were provided to participants. A total of 125 grade four students from 41 Dallas ISD elementary schools participated in the program.

The Dual Language Science Discovery Camp field trips were held on June 26 and June 27, 2018 from 9:00 a.m. to 1:00 p.m., with 360 participating English learner (EL) students, 19 parents, and 49 teachers. Meals and transportation were provided for student participants.

The Environmental Science Day Camp ran on July 10, 2018 and July 24, 2018 from 9:00 a.m. to 3:30 p.m. with attendance of 25 students and 11 teachers.

Classes for all programs were held both outside and inside of the classrooms. Classes and activities included collecting insects and plants, identifying rocks and minerals under a microscope, and discussing events and activities with peers.

Recommendations

- **Continue support for the program.** The number of students and adults served by the center has increased 29 percent since 2016-17. Services provided by the EEC support science teaching in the district.
- **Review center staffing levels.** The number of students and teachers served by the center has increased 29 percent since 2016-17. The increase in demand for services may reflect a need for additional administrative support to maintain the high levels of satisfaction from those who use the services.

Reference

Zhang, J. (2018). 2017-18 Evaluation of Rigorous Interactive Teaching & Learning in Science. Dallas, TX: Dallas Independent School District.

An electronic version of this report can be found at www.dallasisd.org/Page/888. For more information, please contact Program Evaluation at evaluation@dallasisd.org.

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