

2017-18 Evaluation of Rigorous Interactive Teaching & Learning in Science

Jin H Zhang, Ph.D.

EA18-621-4

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. The center's 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 STEM Environmental Education Center is 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?

The total funding for the EEC in 2017-18 was \$149,118 from Title I, Part A. Funds covered personnel, contracted services, and supplies and materials. The funding information was obtained from the workscope and updated information from Special Revenue Funds Management.

What programs and services did the EEC provide in 2017-18?

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 district students from kindergarten through high school. Some of these services included:

- experienced teachers, naturalists, and volunteers 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;
- 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;
- 70-seat ecology theater;
- 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;
- fossil collection for observation and study;
- vegetable, flower, and herb gardens;
- astronomical observatory with telescopes, binoculars, and other astronomy equipment; and
- a FullDome Reality Planetarium.

Source: Data from district website, November 7, 2017.

Table 1 displays programs by grade level.

Table 1: 2017-18 EEC Programs by Grade Level

Grade	Programs
Kinder-garten	All About Animals; Discover Water, Weather, and Wildlife; Trees from Tiny to Gigantic; Secrets of the Woods and Meadows.
First	Mammals and More; Signs of the Seasons; Forest Food Chain; and Sensational Seeds.
Second	Amazing Arthropods; How's the Weather?; Our Green World; and Web of Life Discovery Walk.
Third	Water, Weather, and Wildlife; Discover the Woods and Meadows Ecosystems; Feathered Friends; Exploring Our Solar System, and Earth Systems.
Fourth	Forest Ecosystem Investigation; Green World; Animal Adaptations - Reptiles and Amphibians; Water, Water, Everywhere; Down and Dirty!; and Sensing the Future (Weather Forecasting).
Fifth	Animal Adaptations - Birds and Niches; Walking With Wonder – The Forest Revealed; Leaf Litter Detectives; Meet the Critters - Predators and Niches; Pond Ecology; Our Changing World, Fossils; A Clue to the Past; Weather and Our Atmosphere; and Exploring the Sun, Earth and Moon System.
Sixth	Taxonomic Groups; Limnology-Ecology of a Freshwater Pond; All Things are Connected-Interdependence in the Woods; Grassland Ecology; Here Comes the Sun; Meet the Critters - Reptiles and Amphibians; and Rocks and Minerals.
Seventh	Animal Adaptations – Birds; Limnology -Ecology of a Freshwater Pond; Forest Ecology -Post Oak Preserve Trail Walk; Grassland Ecology; Meet the Critters-Reptiles and Amphibians; Texas Land and Water - Blackland Prairie; and Compost Happens.
Eighth	Animal Adaptations – Birds; Ecosystem of a Freshwater Pond; Ecosystem of the Forest; Reptiles and Amphibians – A Unique Group; Understanding Climate, Weather and Seasons; and Your Planet – Your Decisions.
High School	Birds -Adaptations and Ecology; Forest Ecology; Grassland Ecology; Unique Group -Reptiles and Amphibians; Limnology of the Freshwater Pond; and Freshwater Pond Ecology.

Source: Data from EEC staff 11/07/2017.

What were the results of the program manager interview?

The evaluator conducted an on-site observation and an interview with the program manager on November 7, 2017.

The interview revealed that the facility and electronic devices in the EEC were outdated and funding was needed to make upgrades. It was also noted that teachers and students could not make their field trips as expected due to budget cuts for bus transportation.

The EEC invited teachers and students to visit the center each year. Table 2 displays 2015-16 through 2017-18 number of students visiting.

Table 2: 2015-16, 2016-17, and 2017-18 Number of Students Visiting EEC

	15-16	16-17	17-18
August	-	-	25
September	965	1,940	1,127
October	2,760	3,451	2,761
November	2,743	2,209	1,898
December	1,268	1,378	1,083
January	874	873	1,662
February	1,254	1,924	2,297
March	2,040	2,349	1,643
April	2,534	3,599	2,402
May	1,791	3,657	2,980
June	125	125	100
Astronomy Field Trips	157	214	209
Outreach/Tutoring	127	2,009	8,561
Camping	-	113	-
Total	16,638	23,841	26,748

Source: Data from EEC staff 12/21/2017 and 6/29/2018.

Note: Outreach/tutoring included students, parents, and teachers.

The EEC invited students and teachers to participate in events such as: NASA, 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 had the opportunity to take advantage of the astronomical observatory and to use telescopes, binoculars, and other astronomy equipment. Table 3 displays number of students and teachers who visited the planetarium.

Table 3: 2017-18 Number of Students and Teachers Visiting the Planetarium by Semester

Semester	Students	Teachers	Science Teachers
Fall 2017	72	15	729
Spring 2018	137	18	1,371
Total	209	33	2,100

Source: Data from EEC staff 2/12/2017 and 6/29/2018.

Note: Science teachers included teachers accompanying students visiting EEC.

The Living Materials Request (LMR) is another service available to district science teachers from pre-K through grade 12. Teachers submitted their requests two weeks in advance of the date material was needed. The EEC supplied live specimens and materials including: terrestrial plants (moss, fern, etc.), aquatic plants (duckweed, elodea, etc.), seeds, microorganisms (bacteria, algae, etc.), invertebrates (vinegar eels, land snails, earthworms, cricket, etc.) and other materials (potting soil, peat pots, etc.). Table 4 displays LMR services provided to schools by school level.

Table 4: 2016-17 and 2017-18 Living Material Request Service by School Level

Schools Level	# of Schools	# of Classes
2016-17		
Elementary School	101	1,235
Middle School	7	78
High School	15	260
Total	123	1,573
2017-18		
Elementary School	115	1,229
Middle School	12	418
High School	23	358
Total	150	2,005

Source: Data from EEC staff 12/21/2017 and 5/31/2018.

Were teachers satisfied with the living material request service?

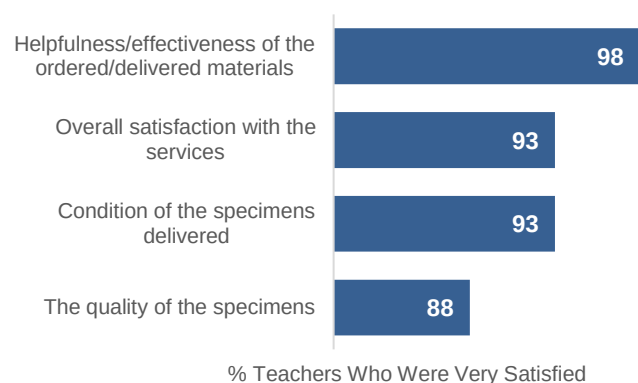
Methodology

To better serve the district, the EEC sent out a survey to schools from August 29 through November 3, 2017. Forty-two teachers from different school levels completed the survey. Data were obtained from EEC management and frequency analyses were conducted.

Results

The teacher survey included several questions and asked teachers to rate the services EEC provided for living material request using a scale from 1 through 5, with 1 indicating least satisfied and 5 for very satisfied. As seen in Figure 1, teachers' responses were positive.

Figure 1: 2017-18 Living Material Request Teacher Survey Results



Source: Data from EEC staff 11/7/2017.

Were teachers satisfied with field trips to the EEC?

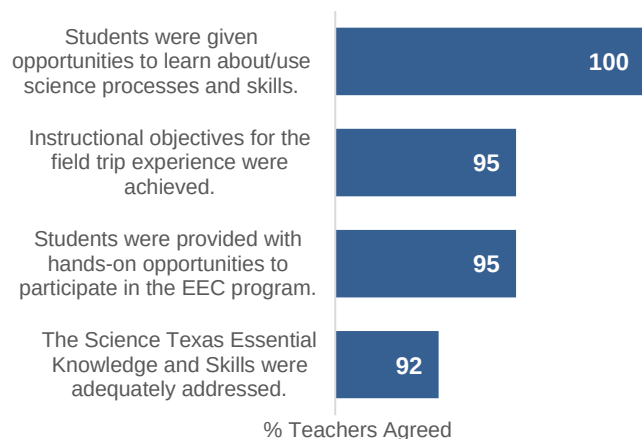
Methodology

To collect the feedback from teachers about field trips, the EEC sent out a survey to district schools from September 11 through November 7, 2017. Thirty-nine teachers completed the survey. Data were obtained from EEC management and frequency analyses were conducted.

Results

The EEC provided field trip service and programs to students from K through high school such as "All About Animals", "Feathered Friends", "Forest Ecology" and more. As seen in Figure 2, most teachers responded positively.

Figure 2: 2017-18 Field Trip Teacher Survey Results



Source: Data were extracted from teacher survey 11/10/2017.

How was the 2017 summer science enrichment program implemented?

Methodology

Documents of activities and student attendance were obtained from the program staff.

Results

The three-week summer science enrichment program was held from June 5 through June 23, 2017 at the EEC. A total of 125 fourth-grade students from 44 Dallas ISD elementary schools participated in the program.

Of the 125 summer program participants, 84 (67.2%) were Hispanic, 19 (15.2%) were African American, 13 (10.4%) were white, and nine (7.2%) were classified as other. Classes were held five days a week, Monday through Friday, from 9:00 a.m. to 3:00 p.m. Breakfast, lunch and transportation were provided to the participants. Students were divided into five different groups (Table 5).

Table 5: 2017 Summer Science Enrichment Program Participants by Group

Student Group	Participants
Armadillos	27
Bald Eagle	24
Dimetrodons	24
Elements of Water	24
The Luna Moths	26
Total	125

Source: Data from EEC staff 1/23/2018.

Classes 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.

Recommendation

Consider additional funding to update the EEC facilities, update electronic devices, and support student field trips to the center. Based on the interview with the program manager, additional funding could benefit students.

Reference

Dallas ISD Website. (2018). Retrieved January 10, 2018 from <https://www.dallasisd.org/Page/43896>.

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.

© 2018 Dallas Independent School District (Dallas ISD)

Mail a written request for permission to use or reproduce any part of this document to:

Dallas ISD

Department of Evaluation and Assessment

H. B. Bell School Support Service Center

2909 N. Buckner Blvd.

Box 10

Dallas, TX 75228