



# **Executive Summary Evaluation Of the AgSTEM Summer STEM Educator Workshop**

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Educational Dynamix  
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## Executive Summary

The evaluation of the AgSTEM Summer STEM Educator Program supports the objective of the project, which was to engage STEM educators in a summer professional development experience that focused on integrating aquaponics and computer science into the curriculum. The experience included two major components:

- A four-week aggrotech and computer science virtual workshop hosted by Mercer University's STEM Education Innovation Lab
- Support for capacity-building and social entrepreneurship projects to be implemented during the 2020-21 school year.

Evaluation of this project included an examination of perspectives of the topics covered during the professional development, which were:

- Tying aquaponics and computer science to the curriculum
- Designing authentic assessments that integrate aquaponics and computer science
- Using real time data in the classroom
- Incorporating authentic scientific investigation and engineering design challenges into the classroom that use aquaponics and computer science as a basis
- Sustainable maintenance and use of an aquaponics system as an educational tool
- Coding for the STEM classroom
- Creating social entrepreneurship projects with AgSTEM
- Making aquaponics a value add for your school

The data were used to ascertain the effectiveness of the AgSTEM Summer STEM Educator Program. There were 31 participants in the program in grade levels K – 12.

The evaluator collected data using uniform and consistent questionnaires and protocols and content materials designed to understand the AgSTEM professional learning. Analysis of content was performed to triangulate the purposes with the intent of the professional learning.

On July 16, 2020, a virtual focus group was held with the team leaders from the participating schools to provide their perceptions of the professional development. On July 20,

2020, principals of the participating schools joined in a virtual focus group to discuss the ongoing support of the program.

Questionnaire surveys were completed at various stages of the professional learning with a final survey given at the end of the session. The surveys included a demographic and initial interest survey, an AgSTEM Professional Development Debriefing Survey, and the Mercer University AgSTEM Summer STEM Educator Workshop Survey.

### ***Data Analysis and Reporting***

The information that follows provides a summary of the examination of each of the components including content analysis, focus groups, and survey questionnaires. The data were aligned to the purpose of the AgSTEM Professional Development. The program was evaluated on how its implementation carried out the purpose and intent of the STEM professional development.

### ***Analysis of focus groups***

The three categories of implementation, virtual learning, and communication from the principals' focus group summary were aligned with the leaders' dialogue from their focus group in the figure. Overall, team leaders and administrators perceived that the AgSTEM program was important to their schools. Each focus group discussed professional learning through the school year and incorporation of AgSTEM in school meetings. All team leaders believed the program benefited teachers and students. With the unanswered question of in-person or virtual learning, how to approach AgSTEM in the school setting was unknown. Common needs included ongoing professional development and training in computer apps.

### **Analysis of data across evaluation methods**

The plan for the AgSTEM professional development was first envisioned as a two-week face-to-face session with hands-on experiences; however, COVID-19 caused the planners to reconsider and provide the program virtually. With that change, the sessions were moved to a four-week experience with participants working asynchronous two times a week and coming together for instruction synchronously once a week. The majority of participants adjusted well; however, others hoped for the face-to-face experiences. Considering the virtual approach to learning, participants suggested a more structured approach to starting the professional development.

The participants appreciated the ‘spread out’ approach over the four weeks and the strong implementation of asynchronous lessons and that supported the synchronous lesson. Further, the participants valued having the website as a ‘one stop shopping.’ They suggested having asynchronous lessons prepped at least a week in advance and defining expectations in advance would be helpful.

The participants believed that the open communication between the attendees and experts was a strong aspect of the AgSTEM professional development. Three items from the Mercer University AgSTEM Summer STEM Educator Workshop soundly supported the professional development structure:

- The virtual structure for learning was suitable for the workshop.
- Personnel conducting professional learning exhibited qualities essential to a successful professional learning experience, i.e. knowledgeable, creativity, and appropriate written and oral communication, effective interpersonal skills.
- Personnel conducting the professional learning effectively modeled the strategies and skills that were taught.

Finally, participants indicated that the professional development was challenging and required viewing videos and readings that they believed could have been reduced. One respondent indicated “I would love to see some of the work pared down so that we could focus on the essentials.” Another participant suggested the work seemed to be for middle and high school teachers. However, overall the participants appreciated the support that was rendered and the responsiveness of the facilitators of the program.

### *A Look at the Objectives*

The objectives of the AgSTEM professional development were incorporated in the modules with many spanning over the majority of the modules. It seems that if the objectives were included in multiple modules then clarification of purpose was supported more.

Figure 1. A Look at Objectives across the Modules

| OBJECTIVES INCLUDES WEIGHTED AVERAGES OUT OF 5. | MODULE 1 INTRO TO AGSTEM | MODULE 2 CONNECTING AGSTEM TO TEACHING & LEARNING STANDARDS | MODULE 3 SOCIAL ENTREPRENEURSHIP/ SERVICE-LEARNING IN AGSTEM | MODULE 4 AGSTEM CURRICULAR DESIGN |
|---|--------------------------|---|--|-----------------------------------|
|   |                          |   |  |                                   |

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|--|--------------------------|---|--|-----------------------------------|
| <b>Tying aquaponics and computer science to the curriculum</b>   | X                        | X   | X  | X                                 |
| <b>Designing authentic assessments that integrate aquaponics and computer science</b>  |                          |   |  | X                                 |
| <b>Using real time data in the classroom</b>   |                          | X   | X  | X                                 |
| <b>Incorporating authentic scientific investigation and engineering design challenges into the classroom that use aquaponics and computer science as a basis</b> |                          | X   | X  | X                                 |
| <b>Sustainable maintenance and use of an aquaponics system as an educational tool</b>  | X                        | X   |  | X                                 |
| <b>Coding for the STEM classroom</b>   |                          | X   | X  | X                                 |
| <b>Creating social entrepreneurship projects with AgSTEM</b>   |                          |   | X  |                                   |
| <b>Making aquaponics a value add for your school</b>   | X                        | X   | X  | X                                 |

Several comments from participants supported the Likert Scale rating seen in the survey. For example, the respondents discussed how including AgSTEM in the assessment process was unclear, especially with assessments being preset at their schools. In summary, the participants indicated they believed the course was a ‘great program’ and was well done in the virtual format.

### *Moving Forward*

One of the major components of the AgSTEM program was the support for capacity-building and social entrepreneurship projects implemented during the 2020-21 school year. How to accomplish this purpose was met with the question of whether schools would meet virtually or face-to-face. The uncertainty caused the school leadership and program participants to discuss the strategies used for teaching and learning. The participants reached the conclusion that they would be able to implement projects that support AgSTEM in either setting. Further, they looked forward to vertically aligning across grade levels.

There was discussion about project-based learning and a need to provide professional development in this area to support teachers. Students had demonstrated higher level of engagement when they were involved in the AgSTEM activities previously. Further, the principals’ conversation demonstrated commitment to implementing AgSTEM in their schools. Ninety five percent of the teachers (21) indicated that resources were available at their site to assist in applying the content, strategies and skills learned in the AgSTEM professional development.

The participants (21) indicated they would share AgSTEM via a grade-level meeting (95%), include in lesson plans and class instruction (98%) and share in department meeting (90%).

Finally, participants believed that AgSTEM would influence student achievement by providing real world connections, making learning fun, increasing engagement, focusing on authentic learning experiences, and learning sustainability and social entrepreneurship.