

The Impact of DIGS Agricultural Curriculum on Agricultural Literacy

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## **The Impact of DIGS Agricultural Curriculum on Agricultural Literacy**

### **Introduction**

Through a partnership between the Colorado State University (CSU) Program of Agricultural Education and CSU Extension AmeriCorps, an eight-month agricultural curriculum was developed called DIGS, which stands for *Developing Individuals, Growing Stewards*. This curriculum aims to expose third through fifth graders to agriculture knowledge and encourage them to have a positive agriculture experience. The DIGS curriculum was designed to last throughout the school year, with monthly lessons emphasizing different pathways in agriculture. This research aimed to explore the impacts of this year-long, formal agricultural curriculum on participants' agricultural literacy. Using a mixed methods approach to analyze the data, the research team used assessment scores and completed a content analysis on activity booklets associated with the curriculum.

### **Conceptual Framework**

Many individuals and organizations define agricultural literacy. These definitions range from understanding food and fiber as a system (National Research Council, 1988), the ability to "synthesize, analyze, and communicate basic information about agriculture" (Frick et al., 1991, p. 52), thinking critically, and discussing agriculture (Powell et al., 2008), making agriculture decisions (Kovar & Ball, 2013), and more. This research project attempted to combine all these definitions to create our theoretical base, which the research team will use to analyze students' agricultural literacy. The themes that emerge from these definitions help create this combination seeing agriculture as a system with interacting pieces, the importance of relationships, an investment in agriculture based on critical thinking and decision-making, the ability to communicate, and the drive to face problems facing the agricultural industry (National Center for Agricultural Literacy, n.d.). This project utilizes these themes in agricultural literacy to best evaluate how the DIGS curriculum impacted students.

To evaluate students, researchers utilized the Longhurst Murray Agricultural Literacy Instrument (LMALI), an assessment for kindergarten-fifth graders to evaluate their agricultural literacy. This 15-question assessment uses the number of correct answers to gauge students' level of agricultural literacy knowledge, using the identifying levels of exposure, factually literate, and proficiency (Longhurst et al., 2019).

### **Methodology**

Two rural elementary schools implemented the DIGS curriculum over eight months, starting in September and ending in April. These lessons were hands-on and interactive, designed to encourage students to have a positive experience with agriculture. Students in this project were also given DIGS activity booklets with a supplemental activity and notes page for each lesson.

Seventy-two students completed a DIGS lesson monthly for an entire school year across the two schools and three grades. These students completed the LMALI assessment before and after the curriculum to evaluate their change in agricultural knowledge. Fifty-eight of these

students also completed the DIGS activity booklets throughout the curriculum. Participants answered questions about the lessons in these booklets and shared their reflections and thoughts on the pathway, industry, and curriculum.

To analyze the data and assess the impact of the DIGS curriculum on agricultural literacy, researchers performed a paired t-test between the pre-and post-curriculum LMALI scores. This allowed researchers to see the change and significance in scores for each class. Researchers also performed a content analysis on the DIGS activity booklets. Using an emergent coding method, coders found quotes and drawings that fit into frames of agricultural literacy pre-identified by the research team. These frames included understanding agriculture as a system, identifying relationships, and investing in the future of agriculture.

## Results

Five classes completed the DIGS curriculum, including three third-grade classes, one fourth-grade, and one fifth-grade. The participating classes completed the LMALI assessment before and after the curriculum was delivered. While all classes increased slightly, four out of the five significantly increased scores ( $p < 0.05$ ). The average score overall for data able to be published from this sample was 9.11 out of 15. The pre-curriculum average was 6.92. According to Longhurst et al. (2019), this score represents a *factually literate* individual. Before the curriculum, the average scores for each class placed them in the exposure level of agricultural literacy. The four classes which significantly increased moved into the *factually literate* level.

Fifty-eight students completed the DIGS activity booklets throughout the curriculum. Through the content analysis, researchers found that 90% ( $n=52$ ) of the booklets had at least one quote indicating agricultural literacy. These quotes ranged from expressing interest in agricultural activities to relating different pathways in agriculture to one another. Researchers found a total of 204 quotes indicating agricultural literacy.

## Conclusions

The LMALI assessment and content analysis data show that the DIGS curriculum impacted agricultural literacy. Statistical analysis determined that students saw a significant increase in agricultural knowledge in all but one class, which also showed increased, though not significant, changes, as demonstrated by the LMALI scores. The content analysis indicated that students demonstrated agricultural literacy throughout the curriculum by evaluating quotes and drawings in 90% ( $n=52$ ) of the books. Overall, the curriculum positively impacted the students' agricultural literacy.

## Recommendations

This project and the results above indicate the potential positive impact of formal education utilizing a yearlong agricultural literacy curriculum. This demonstrates the importance of including agricultural curricula in an elementary school setting. Results varied based on the mode of delivery, teacher, and location, representing limitations to this research. However, all classes saw an increase in agricultural literacy after completing the quantitative analysis, confirmed by the qualitative analysis of the curriculum booklets. This research project recommends encouraging agricultural educators to create and integrate agricultural literacy curriculums in various settings.

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