

Defining Fidelity in the Curriculum for Agricultural Science Education (CASE)

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Introduction/Conceptual Framework

The Curriculum for Agricultural Science Education (CASE) is a project by the National Council of Agricultural Education, managed by the National Association of Agricultural Educators, who are affiliates of the STEM Education Coalition. CASE is a student directed and inquiry-based curriculum aligned to the national standards of Agriculture, Food, and Natural Resources (AFNR), science, mathematics, and English with every lesson. As this curriculum has been implemented, a new question arises; how can one say the CASE curriculum is being taught to the fullest potential? How is fidelity defined in the classroom? Moncher and Prinz (1991), Yeaton and Sechrest (1981), and de Leeuw et al. (2020) suggest fidelity of implementation is the degree to which a treatment/intervention is implemented as intended. A direct correlation between fidelity and student outcomes have been reported (Al Otaiba & Fuchs, 2006; Carroll et al., 2007; Durlak & DuPre, 2008; Kaderavek & Justice, 2010); however, the term is loosely defined, and measurements are varied across the field of education (Durlak, 2010; Durlak & DuPre, 2008; Green, 2001). When fidelity is missing, one can only assume curriculum is not being delivered adequately with the measurements intended. Measuring fidelity has meaning when making claims of the effectiveness in the classroom (Vartuli & Rohs, 2009).

Chen's (1998) key domains affecting curriculum fidelity served framework to guide this study. This framework has four components, (1) school context, (2) curriculum implementation systems, (3) curriculum implementers, and (4) audiences targeted. All four parts play a role in curriculum fidelity. School context deals with the type of school (private vs public), the school size, and school climate. The curriculum implementation systems include the barriers to implementing the curriculum and the availability of training for educators to use the curriculum. The purpose of this study was to explore the definition of fidelity in the delivery of the CASE.

Method and Procedures

This study employed a basic qualitative design (Merriam, 2009) and included all members of the CASE executive committee, which consisted of teacher educators, secondary educators, and state leaders for agricultural education. We conducted 30–40-minute phone interviews with each participant using an interview protocol with six questions. A comparative method of data analysis was used to identify themes (Merriam, 2009). Interviews were transcribed, data was coded, and themes were delineated to provide validation of analysis. Trustworthiness and reliability of data were established through a research log, peer review of data analysis, and member checks (Lincoln & Guba, 1985). Braun and Clark (2006) thematic analysis was used in reviewing the transcripts.

Findings

Several benefits of CASE curriculum were identified by the participants of this study. The benefits identified included inquiry-based learning, resources for educators, and assistance for novice educators. A heavy focus was placed on inquiry-based learning. Jake indicated, "CASE gives teachers a tool to do what agricultural education has claimed it's done forever, which is hands-on problems-based teaching." Participants saw significant value in the resources CASE provided to educators. Patrick indicated, "CASE cuts down on teacher prep time and is a support for teachers. This support is from having high quality curriculum and quality professional development which can enhance the classroom experience for students." Natalie highlighted, "CASE as being turn-key, which provides young and experienced teachers with valuable resources to enhance classroom teaching." The participants noted the value of the curriculum for beginning teachers. Jake spoke about novice teachers at length and stated,

“teachers might be more motivated and stick around longer. I have had a 30 year plus veteran, tell me they are so excited to teach another 8-10 years.”

The participants believed the CASE curriculum can be delivered in several ways but emphasized the importance of the spiraling and scaffolding of the curriculum. Natalie stated, “it can be adjusted to fit the local environment or local needs.” Tanna added that the curriculum can be augmented to meet the interest of your students. Natalie shared, “the concepts in CASE are solid, but the delivery can be augmented to fit the needs of the program.”

A final theme identified by participants focused on the assessment and the high expectation by CASE for the curriculum. As a teacher when delivering CASE, Patrick stated, “CASE is not saying that every single APP, is the absolute best way to teach everything, but it’s a solid place to start.” In addition, Patrick shared, “if someone could get through half the curriculum, but if they are delivering the curriculum as intended, I view that as being done with fidelity.” Natalie believes the true assessment is the end of course assessment and states, “they are delivering the lessons in the course sequentially, as its been designed in the program, they have the appropriate equipment and supplies... and the teacher is properly trained or certified...they are assessing the students at the end of the course, so we have data.” Natalie also shared, “It should be 100 percent... if the assessments are based on the course, and the students take the assessment, if they don’t finish the course, they are certainly not going to score well on the assessments at the end of the course.”

Conclusions/Recommendations/Implications

This study helps to shed some light on defining fidelity for CASE as it presents some unique benefits and challenges of delivery that could affect fidelity. Overall, participants believed the curriculum was beneficial to agricultural educators no matter if they were beginning their career or are established professionals. This aligns with Chen’s (1998) key domains affecting curriculum development because the curriculum implementer’s attitudes towards CASE are positive allowing for the delivery to be with fidelity. The professional development events provided allow the curriculum implementation systems to play a part to ensure the curriculum has fidelity (Chen, 1998). With a heavy focus within the curriculum being directed towards inquiry-based instruction, the participants believed the curriculum was beneficial for students in the agricultural education class. As highlighted in Zohar and Nemet (2002) study, inquiry-based learning groups performed higher on assessments as opposed to the traditional group. When inquiry-based instruction is utilized in the classroom, students gain a higher level of understanding of the material being taught in the classroom and allows for practice of the scientific inquiry (Skelton et al., 2018; Witt, 2010).

Among participants, there was a coherent agreement to use the curriculum with fidelity, but it was not clear if a teacher could pick and choose which lesson they delivered or if the curriculum would need to be presented from the beginning to end. The variation largely could be due to the standards that are adapted by each state, as some states do not follow specific state standards. As there was not one simple definition of fidelity, one can assume the CASE curriculum is being delivered adequately with how it is intended to be delivered. Fidelity can be measured by the effectiveness of the curriculum in the classroom (Vartuli & Rohs, 2009).

Future research should focus on how the lead teachers view the delivery of the CASE curriculum and to what level the curriculum needs to be delivered to reach teaching it with fidelity. As leaders of SBAE, we must understand the needs of teachers and work to provide the highest quality of professional development possible.

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