

**How do State Standards Align: A Comparison of South Carolina
Standards to AFNR Standards**

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Introduction/Need for Research

Content standards are the basis which school-based agricultural education (SBAE) teachers, school districts, and state departments of education rely on to develop effective and relevant instruction to prepare students for future agricultural careers and support the needs of the community (Molina, 2009; Swafford, 2018). Content standards need to be current to support effective SBAE teachers, build capacity for abstract learning, prepare students for science, technology, engineering, and math (STEM) based agricultural careers (Swafford, 2018). Judson et al. (2020) defined the process of teachers adapting standards to meet the needs, beliefs, culture, and values of the community as the sensemaking of educational standards. Judson et al. (2020) suggested that strong state standards provide a needed structure to empower teachers while still giving the sensemaking freedom to implement and support student learning.

To support these efforts, the Agriculture, Food, and Natural Resources (AFNR) curriculum standards were developed and supported by the National Council for Agricultural Education (2015). AFNR standards provide a baseline to support SBAE career clusters which incorporate STEM integration for multiple agriculture career pathways (The Council, 2015; Swafford, 2018). "Adoption and use of these standards is voluntary; states and local entities are encouraged to adapt the standards to meet local needs" (The Council, 2015, p. 2). This will ultimately allow SBAE teachers to prepare students for future STEM careers by providing rigorous and relevant instruction, while also meeting the needs of the community and program (Judson et al., 2020; Swafford, 2018). The purpose of this study was to determine the extent to which South Carolina SBAE standards align with the AFNR standards within the animal science career pathway. Three research questions guided this study: (1) What percentage of South Carolina SBAE standards align with the AFNR standards for animal science; (2) At what level of Bloom's Taxonomy are the South Carolina SBAE standards written; and (3) How does the level of rigor compare between the South Carolina SBAE standards and AFNR standards?

Theoretical Framework

This study was undergirded by Bloom's taxonomy (1956), which established different levels of learning and engagement as a hierarchical structure representing six levels, ranging from basic learning objectives (i.e., knowledge of content) to higher-order learning (i.e., synthesis and evaluation) (Clemons & Smith, 2017). Blooms formed the basis for early work on the development of instructional objectives for classes and curricula (Anderson et al., 2001). For the purpose of this study, the hierarchical structure was used to determine the cognitive level of animal science standards in South Carolina compared to that of the national AFNR standards.

Methodology

This study implemented a non-experimental existing data design (Privitera, 2020), comparing the South Carolina animal science standards and the national AFNR animal science pathway standards through a content analysis. A research team consisting of a graduate student with nine years of SBAE teaching experience and two faculty members in agricultural education with more than 30 years of combined experience evaluated the state and national standards to answer the

three proposed research questions. Microsoft Excel was implemented to categorize, compare, and analyze the animal science standards through the lens of Bloom's taxonomy (1956).

Results/Findings

The South Carolina animal science pathways included 19 courses and 148 standards that were analyzed in comparison to the AFNR animal science pathway, which consists of 8 standards and 20 performance standards. Ninety-five percent of the AFNR standards are written at or above Blooms' Applying level of Taxonomy, in comparison only 39% of South Carolina standards were written at a comparable level. The majority (57%) of South Carolina standards fell in the lowest taxonomy levels, including 12% at Remembering and 45% at the Understanding level. Additionally, 12% of the South Carolina standards were written at the Applying level, 4% at the Analyzing level, 3% at the Evaluating level, and 20% at the Creating level. Although 20% of South Carolina standards were correlated to "Creating" based on the action verbs used, 17 of the 31 use "Discuss" as the verb, which suggests they are closer to the Understanding level of Bloom's.

Conclusions

Only 39% of South Carolina standards were written at or above the Applying level of Bloom's Taxonomy as compared to 95% of the AFNR standards. The analysis of standards demonstrates the lack of rigor in current South Carolina standards, as they were primarily written at or below the Understanding level. Comparatively, the AFNR standards are written at or above the applying level of Bloom's Taxonomy, allowing students to integrate the new knowledge in the future, draw conclusions, and produce their own products. Unfortunately, the South Carolina standards are asking students to memorize or recall basic information or perhaps describe the material, with students very rarely (less than 39%) getting to the Applying level. According to Ravitch (1995), standards that are vague, unclear, and unmeasurable have little value for teachers and students when it comes to designing lessons that promote abstract learning for STEM integration. This lack of alignment limits the ability to meet the rigor and relevance needed to support SBAE teachers in preparing students for future STEM-based agricultural careers (Judson et al., 2020; Swafford, 2018).

Implications/Recommendations/Impact on Profession

Perhaps South Carolina should consider adopting or cross walking the AFNR standards to support their SBAE programs, as reevaluating and updating the state level standards will allow teachers an opportunity to further increase rigor and relevance of SBAE programs across the state. To accomplish this task, it is recommended that a team of SBAE teachers, state agricultural education staff, and faculty be developed to revise current standards. Further research should investigate the level of rigor taught in SBAE classes across South Carolina, comparing the level of rigor established in the state standards with what is being taught in the classrooms. Although this study highlights concerns with SBAE standards in South Carolina, additional research is needed to see how other states' SBAE standards align with AFNR standards. Ultimately, SBAE standards provide a structure for teachers, but the impact of these standards on student performance and outcomes is unknown.

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