Prescribed Pedagogical Outcomes Versus Real-World Challenges: A Content Analysis of Kansas AFNR Course Competency Profiles

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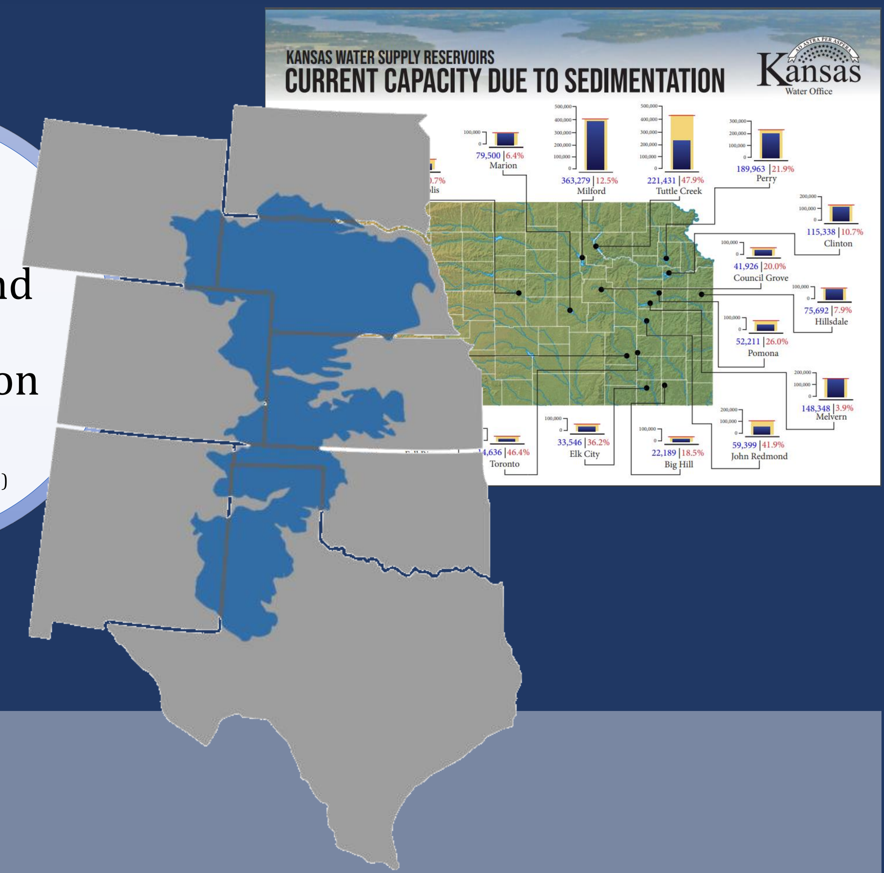
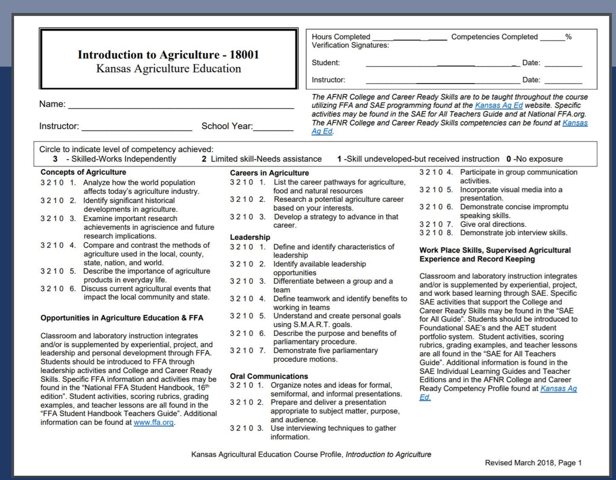
Introduction

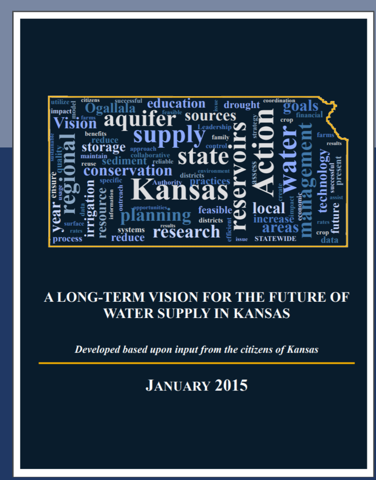
- 2 Purposes of Ag Education – workforce and ag literate citizens (Roberts & Ball, 2009)
- Shifting workforce demands and complex challenges facing agriculture
- Ag responsible for 70% of annual worldwide water withdrawls (Mancosu, Snyder, Kyriakakis, & Spano, 2015)
- Evidence suggests AFNR educators can incorporate water scarcity topics into their curriculum
- Ogallala Aquifer depletion and reservoir sedimentation in Kansas (Kansas Water Office, 2015)



Methodology & Conceptual Framework

- Conceptual Framework:
  - Krifppendorff's Framework for Content Analysis (Krippendorff, 2013)
- Utilized qualitative content analysis methods
- Downloaded Kansas Water Vision & all 36 Kansas AFNR Course Competency Profiles (Kansas Water Office, 2015; Kansas State Department of Education, 2019a)
- Developed codebook to provide proper protocol and pertinent info for coders
  - 2 sections: General Attributes and Coder Categories
  - Code: 0=No Connection, 1=Some Connection. 3=Strong Connection
    - Water Vision Themes: 1). Water Conservation, 2). Water Management, 3). Technologies and Crop Varieties, and 4). Additional Sources of Supply
  - Established intercoder reliability
  - Researchers analyzed data after coding was completed.





Research Objectives

RO1: Determine which Kansas AFNR courses and pathways prescribe water-related outcomes.

RO2: Identify the specific Kansas AFNR course competencies that are connected to the *Kansas Water Vision*.

RO3: Determine the extent to which course competencies are related to the *Kansas Water Vision* themes.

Results & Findings

RO 1

- 5/8 pathways (0 in AgBus, Food Products/Processing, PSTS)
- 17/36 courses included water-related competencies

RO 2

Courses with the Most Water-Related Competencies from Each Pathway and Examples

Pathway and Course Name	Water-Related Competency Example
Animal Science: *Animal Science*[1]	Evaluate the effects of animal agriculture on the environment.
Biotechnology in Agriculture: *Applications in Agricultural Biotechnology*	Design and perform an assay to detect target microorganisms in food, water, or the environment.
Comprehensive Agriculture: *Ag Leadership/Communications*[1]	Research, examine and discuss issues and trends that impact local, state, national, and global agriculture.
Natural Res. and Enviro. Systems: *Natural Resource Management*	Relate the function of watersheds to natural resources.
Plant Systems: *Plant & Soil Science*	Describe how water holding capacity, available water, and wilting points, permeability, leaching are affected by soil texture and nutrient availability.

Note: [1]Courses that tied with another for number of competencies

RO 3

- 2,346 total competencies
- 89 related to 4 themes of *Water Vision* (4% of total)
  - 24 had a "strong" connection (1% of total)
- Strong Connection
  - "Determine the hydraulic conductivity for soil and how the results influence irrigation practices"
  - "Perform a water quality test"
- Some Connection
  - "Develop a plan of action to improve the environment"

Conclusions & Recommendations

- Less than half of courses (47%) w/ WR competencies
- 3 out of 8 Pathways w/ no WR competencies
- Small amount of WR competencies (89/2346 or 4%)
  - Of those related, only 24 (27% of WR) "strongly related"
- NRES Pathway had the most WR competencies
  - Only 10/205 schools offering (179 for Comp. Ag.) (KSDE, 2019b)
- More rigorous review of course profiles needed
  - Include key state agencies/industries/scientists
- Majority of courses could have WR competencies
  - Use existing curriculum
- Develop new interdisciplinary WR course
  - Natural resource management, conservation, irrigation practices, technology, policy, related careers
- Work already happening – Kansas Youth Water Advocates
- Future research:
  - Teacher's perceived ability to teach WR competencies
  - Student achievement/career interests
  - Impact of changes on water practices in state
  - Content analysis of other key interdisciplinary challenges facing industry (i.e. global agriculture production, nutritional needs, rural vitality)

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