

Using a University Agriscience Teaching Methods Class to Test a Science Comprehension Model on 8th Grade Science Students

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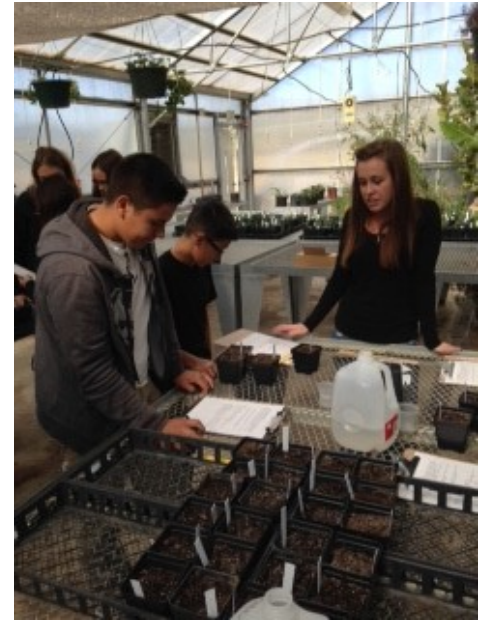
Educational Partnership

- AXED 484: Methods of Teaching Biological, Earth, and Physical Sciences in Agriculture
- NMSU Extension and Research Youth Agricultural Science Center (NMSU-ERYASC)
- Integrating Extension activities with academics

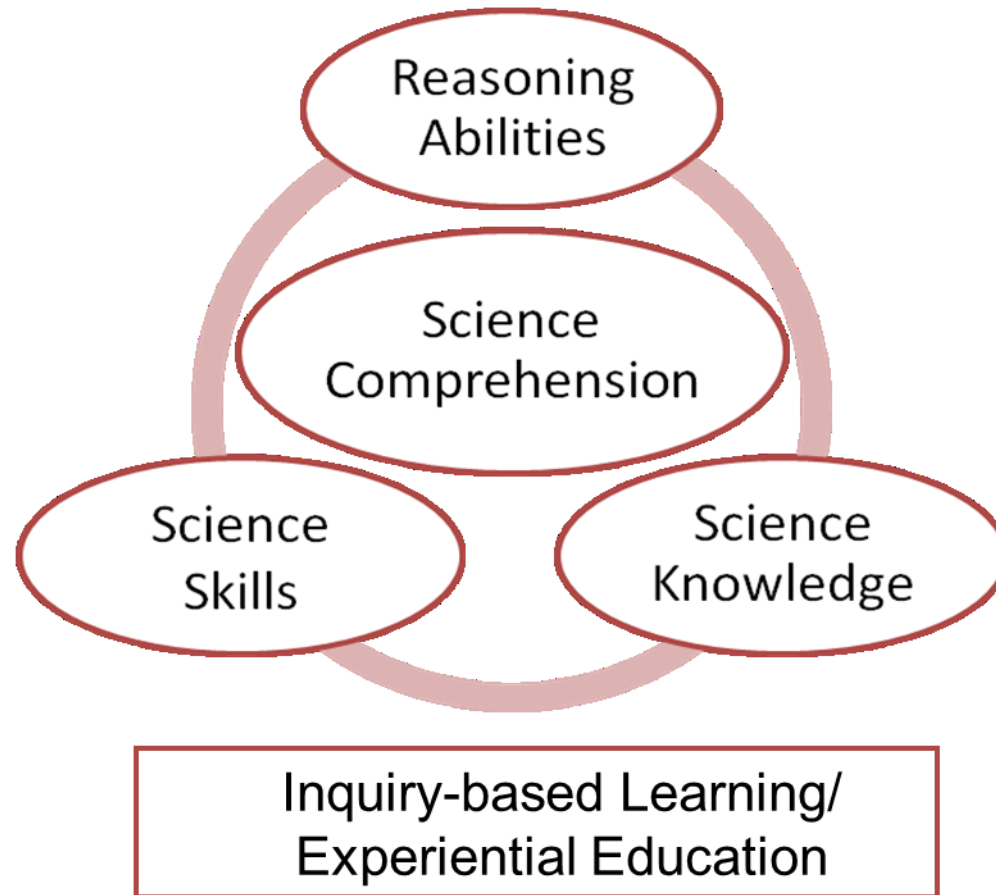


5-Year AES/Hatch Project

- Climate science curriculum for middle school earth and physical sciences
- Potential to adapt curriculum for 4-H project and after school and summer enrichment programs
- Supplemented by Enchanted Life Foundation funding



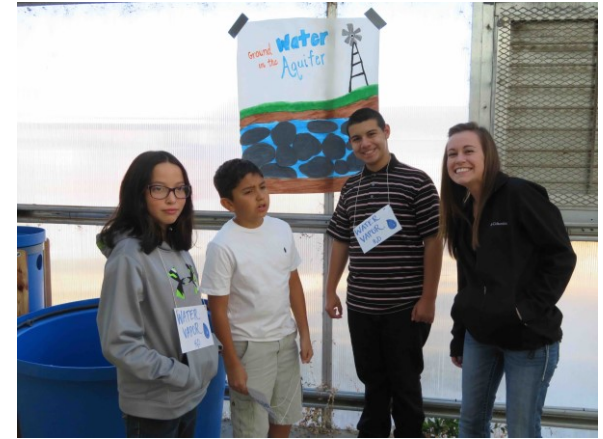
Science Comprehension Conceptual Model



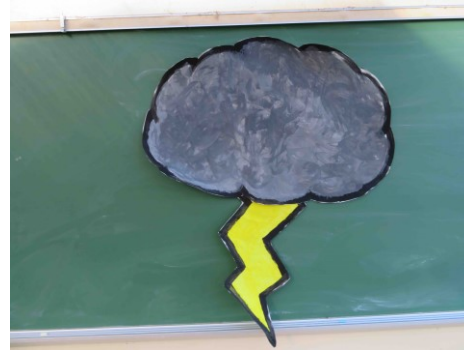
Skelton, P., B. SeEVERS, T. Dormody, and F. Hodnett. 2012. A conceptual process model for improving youth science comprehension. *Journal of Extension*, 50(3), Article 3IAW1.

Pre-service Teacher Education

- Developing and testing lessons at NMSU-ERYASC agriscience field days
- Fall 2016 pilot lesson: The water cycle
 - Interest approach
 - Water cycle PowerPoint presentation the day before the field day followed by a water cycle labeling exercise to start the field day
 - Water cycle drama
 - Corn growth and rainfall regimes experiment
 - Six question whole group summary



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Results

- Feedback from university students (n=6)
 - Opportunities to plan and pilot their lessons met or exceeded expectations
 - Learned how to take information from a variety of sources and develop a lesson that improved middle school student science comprehension, improved their teaching and communication skills by checking for understanding throughout the lesson, and allowed them to identify areas of their lesson they could improve
 - Believed that field-based opportunities to apply what they learn in class are invaluable to their professional development

Results

- Memorial Middle School student post-test data (n=82)
 - 96% of students rated the lab as good or excellent
 - For science knowledge
 - Students averaged 93.63% on a nine-point hydrologic cycle labeling exercise given the day of the lesson
 - Students averaged 77.84% on a six-item multiple choice quiz given the day following the lesson

Results

- Memorial Middle School student post-test data (n=82)
 - For science skill
 - Students averaged 100% on a 3-point exercise preparing 4” pots to test different simulated rainfall regimes on corn growth
 - For reasoning abilities
 - Students averaged 81.34% on a five-point hypothesis statement for their rainfall regimes and corn growth experiment following criteria communicated by the university students

Conclusions

- University student feedback
- Middle school student results suggest the need for lesson modifications
 - Expand in-class delivery of content related to the lesson objectives prior to agriscience field day activities to improve science knowledge scores
 - Spend more time assisting youth with experimental design and hypothesis development prior to agriscience field day activities to improve reasoning abilities scores

Future Directions

- Expand to two-day lessons that address the full science comprehension model
- Measure if repeated application of the model produces a three dimensional spiral of expanding science comprehension over time, shaped much like a tornado
- Integrate the science comprehension model into grades K-5 and 9-12 lesson plans

Thank You!



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