

Agricultural Algebraic Extensive Exploration (A²E²)

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Introduction

Agricultural Algebraic Extensive Exploration (A²E²) is an innovative agriscience course that serves as an alternative to math remediation. Team taught by agriscience and math teachers, A²E² is designed to provide students with rich learning experiences in algebra within the context of agriscience. The results of the mathematics portion of the Texas Assessment of Knowledge and Skills (TAKS), taken by 8th graders in northeast Texas in 2003, indicated that 2,406 students of the 3,500, or 68.7%, failed (Region 8 Educational Service Center, 2003). During 2003-2004, three schools piloted A²E², which is designed for 9th grade Algebra I students who failed the 8th grade TAKS. Currently, 32 out the 48 districts in the region teach the course.

Gliem and Miller (1994) reported that how mathematics is taught has an effect on students' problem solving abilities. Their research showed that incorporating problem solving mathematics with agricultural studies greatly improved math test scores. The A²E² design provides an instructional environment for first time Algebra I students where they will experience mathematics in an agricultural context. Agricultural topics stimulate students to enroll in more agricultural classes and participate in FFA.

How it Works

Schools must apply for permission from the Texas Education Agency to teach the course. The application process assures that the school will send agriscience and math teachers to the required professional development activities. These activities consist of six days of summer training, three Saturday workshops during the school year, and six one-hour sessions for collaboration and planning (before/after school, each six-weeks). Both instructors are expected to be in the classroom for the full instructional period each day for the entire year.

The curriculum, developed by a team of agriscience and math teachers, integrates agriscience and algebra concepts while accommodating multiple learning styles through the use of manipulatives, technology, collaboration, and agricultural projects. Reasoning and communication skills are improved through the introduction of real-world career applications using multiple problem-solving strategies and development of working knowledge in mathematics. Utilizing the A²E² curricula in conjunction with proven instructional strategies proved yielded effective results. The diversity of student enrollment in agriscience also increased as a result of A²E².

Results to Date

A profile of student enrollment for the first two years after piloting is presented in Table 1.

Table 1
Enrollment by Ethnicity & Gender for 2005-2006

Ethnicity and Gender	2004 - 2005		2005 - 2006	
	<i>n</i>	%	<i>n</i>	%
African American Female	12	6%	31	10%
Asian Female	0	<1%	1	<1%
Hispanic Female	5	2%	38	13%
Native Americans Female	1	<1%	3	1%
White Female	73	36%	72	24%
African American Male	14	7%	24	8%
Hispanic Male	7	3%	39	13%
White Male	90	46%	93	31%
Total Enrollment	202		301	

Future Plans

Future plans include expansion of A²E² to other regions of the state. Discussion with state leaders regarding math credit for the course is expected later during this school year. If approved for math credit, A²E² has potential as a nationwide curriculum model.

Cost/Resources

Training provided by Region 8 Educational Service Center costs \$3500 for districts in Region 8 or \$4500 for districts outside of Region 8 and includes:

- Nine days training (for two teachers) with two state master trainers
- Two A²E² curriculum notebooks
- Three \$100 stipends per teacher for Saturday training
- One classroom set of instructional materials for a class of 20

References

- Gliem, J. & Miller, G. (1994). Agricultural education teachers' ability to solve agriculturally related mathematics problems. *The Journal of Agricultural Education*, 35(4), 25-30.
- Region 8 Education Service Center (2003). *What is A²E²?* Retrieved Oct. 1, 2006, Available: <http://www.reg8.net/default.aspx?name=cit.a2e2>
- Achieve Texas (2006). *Achieve Texas in Action A²E².* Retrieved Oct. 26, 2006, Available: http://www.achievetexas.org/PDFs/AchieveTexas_Final.pdf.