



Yearlong Involvement with the Curriculum for Agricultural Science Education: A High School Student Perspective

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Introduction

- The Curriculum for Agricultural Science Education (CASE) is a new, rapidly growing curriculum that purports to enhance the academic rigor of agricultural education at the high school level
- Because it is a new program, very little research exists which examines the impact or perceptions of the participants
- This study sought to take a broad look at the perceptions of students engaged in a yearlong Curriculum for Agricultural Science Education curriculum



Need

- A rigorous, science-based high school agriculture curriculum may improve our ability, on the college level, to recruit and retain high achieving agriculture students.
- The Association of Public Land Grant Universities' *Science & Mathematics Teacher Imperative* calls for an increased emphasis on STEM related middle and high school education.
- The National Research Council 2009 report, *Transforming Agricultural Education for a Changing World*, recommended an increased focus on K-12 education

Conceptual Framework

Grounded in the Person-object Theory of Interest (POI) (Krapp & Fink, 1992)

- The POI focusses on both cognitive and affective aspects of interest

Study examined 5 constructs:

- Critical Thinking
- Task Value
- Autonomy
- Science Lab Self-efficacy
- Cognitive Engagement

Purpose

- Identify the demographic characteristics of students enrolled in CASE courses.
- Identify the means of the constructs of interest for the first, second, and third points of assessment during the yearlong CASE experience.

Methods

- Purposive sample of 4 area high schools (Ary, Jacobs, Razavieh, & Sorensen, 2006)
 - One rural, two large suburban, and one large urban school
 - Results are generalizable only to the respondents
- Researchers conducted assessments in yearlong CASE courses
 - Assessed in September, December, and May

Instrumentation

- All Likert-type instruments, scaled from 1 (strongly disagree) to 6 (strongly agree)
- Critical Thinking
 - Motivated Strategies for Learning Questionnaire (MSLQ) ($\alpha = .72-.75$) (Pintrich, Smith, Garcia, & McKeachie, 1991)
- Task Value
 - MSLQ ($\alpha = .86-.89$)
- Autonomy
 - Learning Climate Questionnaire (LCQ) ($\alpha = .88-.90$) (Deci et al., 1991)
- Science Self-efficacy
 - Science Self-efficacy ($\alpha = .86-.90$) (Britner, 2000)
- Cognitive Engagement
 - Motivated Task statements ($\alpha = .89-.91$) (Greene et al., 2004)

Results: Obj. 1

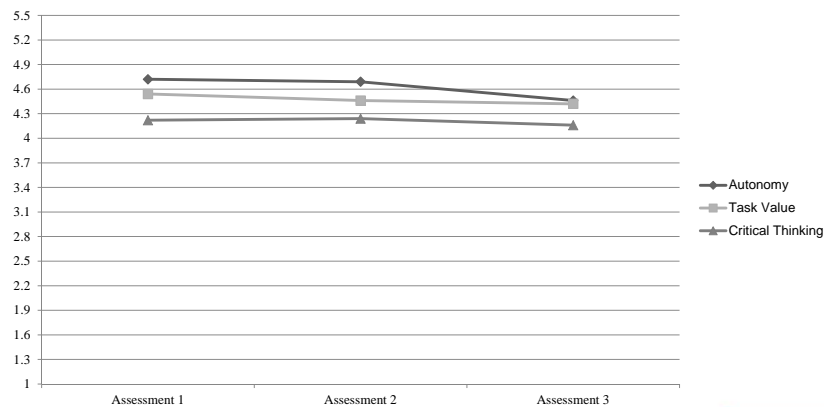
- Total of 353 respondents from four schools
 - Two larger schools with CASE enrollments of 125 and 136
 - Two smaller schools with enrollments of 69 and 23
 - Course enrollments
 - Introduction to Agriculture, Food, and Natural Resources – 87
 - Principles of Agricultural Science (Animal) – 59
 - Principles of Agricultural Sciences (Plant) – 207
 - Demographic data provided by the course instructors

Results: Obj. 1

Characteristic	f	%
Sex (n = 315)		
Male	160	45.19
Female	155	43.78
Grade level (n = 315)		
Freshman	70	19.77
Sophomore	70	19.77
Junior	95	26.83
Senior	80	22.59
IEP (n = 315)		
Yes	47	13.27
No	268	75.70
TAG (n =315)		
Yes	15	4.20
No	300	84.72
ELL (n = 315)		
Yes	30	12.70
No	270	76.30
A participant in FFA (n =315)		
Yes	108	30.50
No	207	58.50
Science credit (n = 315)		
Yes	230	65.00
No	85	24.00
College credit (n =315)		
Yes	26	7.30
No	289	81.60

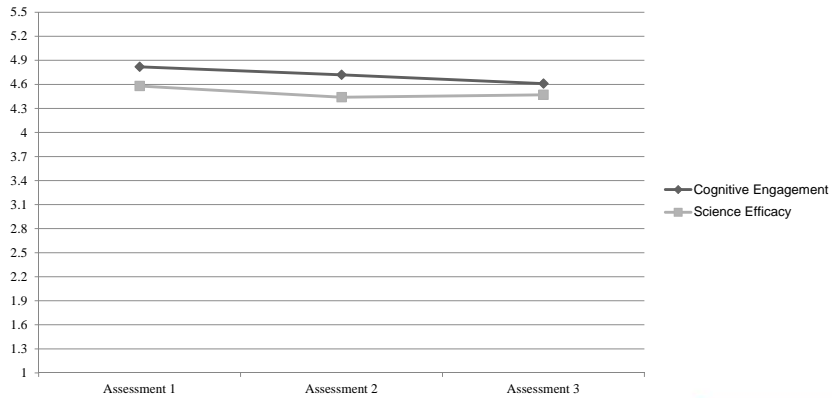
Results: Obj. 2

Student Perceptions of Autonomy, Task Value, and Critical Thinking (n = 173)



Results: Obj. 2

Student Perceptions of Science Efficacy and Cognitive Engagement (n = 173)



Results: Obj. 3

Spearman's rho correlations between grade level and the constructs of interest (n = 173)

Ordinal Variable	Interval Variable	Value
Grade Level		
X	Autonomy	.12 ^b
X	Task Value	-.01 ^a
X	Critical Thinking	-.06 ^a
X	Science Efficacy	.02 ^a
X	Cognitive Engagement	.02 ^a

Note. All correlations and effect sizes are less than $r = .20$ ($<.04$). Grade level was coded 1 = Freshman, 2 = Sophomore, 3 = Junior, 4 = Senior
^a=trivial, ^b=small



Results: Obj. 3

Point-biserial correlations between dichotomous nominal and interval variables (n = 173)

		Autonomy	Task Value	Critical Thinking	Science Efficacy	Cognitive Engagement
Gender	r_{pb}	-.25*	-.21*	-.08	-.15*	-.22*
	Sig.	.00	.00	.25	.04	.00
IEP	r_{pb}	-.12	-.10	-.04	-.19*	-.09
	Sig.	.18	.21	.61	.01	.22
504	r_{pb}	.08	-.00	-.04	.00	.07
	Sig.	.30	.96	.63	.98	.35
ELL	r_{pb}	-.21*	-.24*	-.10	-.19*	-.26*
	Sig.	.00	.00	.18	.01	.00
TAG	r_{pb}	.15	.12	.15*	.08	.17*
	Sig.	.05	.10	.05	.29	.02
Active in FFA	r_{pb}	.25*	.21*	.15	.24*	.21*
	Sig.	.00	.00	.05	.00	.00
Science Credit	r_{pb}	.16*	.00	-.06	.02	.02
	Sig.	.04	.93	.47	.82	.79

Note. All effect size descriptors for statistically significant correlations fall within the small (.10-.30) designation. All dichotomous variables were coded 0 = no, 1 = yes. Gender was coded 0 = females, 1 = males.
* Correlation is significant at the 0.05 level (2-tailed).

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Conclusions

- No statistically significant mean differences between the three points of assessment
- Context specific
 - Two schools showed slight gains
 - Two schools showed slight decreases
- Students active in FFA perceive themselves to be “engaged” in their CASE curriculum
- Females perceived themselves as higher in all construct areas
- ELL students evidenced lower mean scores in all construct areas

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Recommendations

- Further research with controls for some of the extraneous variables
- Experimental design with assessment of academic scores
- Research which examines the perceptions of ELL and IEP students actively involved in a CASE course
- Longitudinal studies which track future enrollment in post-secondary agriculture enrollment



Thank You

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