

How does CASE Compare to High School Science and Non-Science Courses?

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Introduction & 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

Background

- In 2008, the National Council for Agricultural Education was instrumental in the development of the Curriculum for Agricultural Sciences Education (CASE)
- Modeled after Project Lead The Way (PLTW)
- Project-based & Inquiry-based learning

Conceptual Linkages

- Curriculum may allow:
 - for novelty, discovery, and challenge (tenet 3)
 - be collaborative and promote social interaction (tenet 5)
 - focus on a spiraling model of content acquisition (tenet 6)
 - be learner-centered and provide visual and auditory choices (tenet 12)

(Caine and Caine's Brain Based Learning Theory)

Research Objectives

- Determine level of agreement with science comparison statements
- Determine level of agreement with high school comparison statements

Methods

- Descriptive research reporting “what is” (Borg & Gall, 1996)
- Accessible populations:
 - Students participating in CASE at four Oregon high schools ($N = 353$)
 - Results generalizable only to the respondents

Instrumentation

- Researcher developed instrument based on student open-ended responses to “how does your CASE class differ from your other courses”
- Students identified 133 differences
- Researchers analyzed, collapsed and piloted a Likert-type instrument
- Item test/retest reliabilities were calculated and ratings above .50 were considered acceptable

(Ary, Jacobs, & Sorensen, 2010)

Instrumentation

- 18 statements “compared to a high school science class”
- 14 statements, “compared to other high school classes”
- 6 point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree)
- Stability coefficients ranged from .50-.94

Methods

- Data collection occurred in March
- 258 students responded (73% response rate)
- Surveys were anonymous and participant numbers were coded by the teacher

Results

- Compared to an average *science class*, the following four statements evidenced the highest level of student **agreement**
 - This class has less homework
 - This class is easier for me
 - This class is more fun
 - This class has more activities

Conclusions

- Less homework, easier for me, more fun & more activities:
 - This may relate to the collaborative nature of the curriculum
 - Science, embedded in real-world context is more accessible to students
 - Learning is affected by attitude, emotions, feelings and social interaction (tenet 5)

(Parr, Edwards & Leising, 2009)

Results

- Compared to an average *science class*, the following four statements evidenced the highest level of student **disagreement**
 - This class takes more field trips
 - I learn more about science in this class
 - This class is more focused on me
 - This class has less busywork

Conclusions

- Students
- More field trips, learn more science, focused on me, & less busywork:
 - Students did not think they learned as much science as a science class
 - Students did disagreed that the course focused on them
 - CASE is a paperwork heavy curriculum

Results

- Compared to an average *high school class*, the following four statements evidenced the highest level of student **agreement**
 - I work with my classmates more in this class
 - This class lets me experience what I am learning
 - This class focuses on careers more
 - This class requires more participation

Conclusions

- Work with my classmates more, experience what I am learning, and requires more participation:
 - Support tenet 12 – information should be presented in a visual, auditory, or kinesthetic environment while promoting student investment and autonomy
(Caine & Caine, 1994, 1997)
- Focus on careers: allows students to glimpse the parts and the whole at the same time (tenet 6)

Results

- Compared to an average *high school class*, the following four statements evidenced the highest level of student **disagreement**
 - This class is more important to me
 - This class is more focused on me
 - This class takes more field trips
 - This class is more relevant

Conclusions

- Compared to a typical high school classroom, students did not feel the class was more important, relevant or focused on them.
 - Contrast to tenet 12 which encourages emotional investment
- Field trips: Students indicated CASE is not focused on field trips

Recommendations

- Further research should consider
 - Within school differences
 - Student learning
 - Levels of student motivation, both intrinsic and extrinsic
 - Student perceptions specific to CASE tenets

Thank You

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