Perceptions of Learning in Food & Agricultural Chemistry

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AGR 300: Food and Agricultural Chemistry

• 1972 - Developed and taught to provide organic and biochemistry concepts to agriculture majors.
  • Concerns with similar chemistry taught in Chemistry department
  • Needed an applied chemistry with emphasis on fundamentals of biochemistry
Learning

- External environment will influence internal conditions of the learner
  
  Motivation – desire to learn
  
  - Extrinsic or intrinsic
    
    - Extrinsic – reward and punishment
    
    - Intrinsic – within and if affected by factors such as self-determination, curiosity, challenge and effort
      
      - Results in high-quality learning

  Deci and Ryan 1985, 2000; Santrock, 2011
Assessment of Learning

- **Intrinsic Motivation Inventory (IMI)**
  - Comprises questions to determine a person’s desire to learn
  - Ascertain information regarding the intrinsic motivation of learners
  - Utilizes the personal and emotional issues of the learner
    - Interest and enjoyment
    - Perceived confidence
    - Effort-importance
    - Pressure and tension
    - Value and usefulness

(Markland and Hardy, 1997; Guay et al., 2000)
Methods

SURVEY INSTRUMENT

• Modified Intrinsic Motivation Inventory Survey Instrument
  • Administered day 1 and day 5
  • Part 1 – Intrinsic Motivation
    • 5 sections – Interest & Enjoyment, Perceived Competence, Effort & Importance, Pressure & Tension, Value & Usefulness
    • 39 questions
    • Likert scale – 1 = not true; 7 = very true
  • Part 2 – Technical & Interpersonal Skills
    • 17 questions; sorted into soft vs hard skills
    • Likert scale 1 = highly skilled; 5 = not skilled
  • Part 3 – Demographic Information
    • 7 questions
Methods

DATA ANALYSIS

• Pre-and post-test results compared using paired t-tests

• Relationships between IMI responses and student demographics assessed using Chi-squared analysis
Results

STUDENT DEMOGRAPHICS

Gender

- Male
- Female

N = 98

Age

- 19-22
- 23-26
- 27-31
- 32-35

N = 95
Results

STUDENT DEMOGRAPHICS

First Generation*

N = 89

Credit Hours Completed

N = 98

*Self-reported
Results

STUDENT DEMOGRAPHICS

Math Completed

- Lower than college algebra
- College algebra
- Higher than college algebra

N = 93

GPA

- < 2.0
- 2.0 - 2.49
- 2.50 - 2.99
- 3.00 - 3.49
- 3.50 - 4.0

N = 92
Results

COURSE IMPACT ON INTRINSIC MOTIVATION

Mean student response*

0 1 2 3 4 5 6 7 8

Interest & Enjoyment Perceived Competence Effort & Importance Pressure & Tension Value & Usefulness

Pre Post

*1 = Not true at all; 7 = Very true
**p < 0.10
***p < 0.05
****p < 0.01
Results

COURSE IMPACT ON SKILLS

Mean student response*

*1 = highly skilled; 5 = Not skilled
**p < 0.10
***p < 0.05
****p < 0.01
Results

COURSE IMPACT CONTENT KNOWLEDGE

Points earned

Pre  Post

p < 0.001
Results

RELATIONSHIP WITH STUDENT CREDIT HOURS

Interest and Enjoyment

<table>
<thead>
<tr>
<th></th>
<th>30-59 hrs</th>
<th>60-89 hrs</th>
<th>90+ hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>No Change</td>
<td>2</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Increase</td>
<td>1</td>
<td>5</td>
<td>30</td>
</tr>
</tbody>
</table>

N = 77
χ² = 0.07
Results

RELATIONSHIP WITH STUDENT CREDIT HOURS

Effort and Importance

- Decrease
- No Change
- Increase

Percent Respondents

30-59 hrs  60-89 hrs  90+ hrs

N = 77
$\chi^2 = 0.001$
Results

RELATIONSHIP WITH STUDENT GENDER

Pressure and Tension

Percent Respondents

Decrease
No Change
Increase

Male
Female

N = 77
χ² = 0.05
Results

RELATIONSHIP WITH STUDENT GPA

Pressure and Tension

Percent Respondents

Decrease | No Change | Increase

<2.0 | 2.0-2.49 | 2.5-2.99 | 3.0-3.49 | 3.5-4.0

N = 77
\chi^2 = 0.04
Final Thoughts

COURSE IN TRANSITION

• Started as applied organic and biochemistry
• Moved into mirroring organic chemistry
• Moving towards a blend of the two
• 2017/2018 data has not been analyzed
• Ongoing study to determine what skills are needed by animal science and agronomy students