Have Student Knowledge Levels Changed? A Decade of Pretest and Posttest Comparisons Across Agricultural Economics Courses in a Small State University Program of Agriculture

C.R. Stark, Jr. (stark@uamont.edu)
P.B. Francis (francis@uamont.edu)

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Fundamental Question

Are student knowledge levels changing?

HYPOTHESIS:
Student knowledge levels are increasing over time.
Background Literature Review

• Basic concept: “College students fail to complete due to poor academic & college skills preparation.”


Other Recent Studies:

– 6 year transfer/non transfer study (Branson & Green, 2007)
– Impact of Orientation Course (Ewing-Cooper & Parker, 2013)
– Skills competency (Turner, et al. 2013)
Background Literature Review

• Basic concept: “College students fail to complete due to poor academic & college skills preparation.”

– “Early Leavers” – 5 year study (Cole & Fanno, 1999)
– Learning styles and performance (Moss, et al. 2002)
– Computer experiences (Johnson, et al. 2002)
– Spatial population density (Colbath & Morrish, 2010)
– Sustainable agriculture (Sitienei & Morrish, 2014)
Testing Methods

• Pre-Test & Post-Test Construction

  – 1/3 Multiple Choice

  – 1/3 Short Answer/Fill In The Blank

  – 1/3 Application Questions

  (i.e. problems, graph & chart interpretations)

[Lavis, Williams, & Thien 2008 NACTA Journal 52:4]
Data

- Annual Academic Unit Assessment Report
- Approximately 1200 student tests
- 2006-2013 time period
- Level
  - Introductory Agricultural Economics
  - Upper Level – Primarily Junior or Senior
Expected Hypothetical Results

- Pretest Results
- Posttest Results

Time

Grade
Pretest Results

\[ y = -0.4093x + 27.034 \]
\[ R^2 = 0.3729 \]
Pretest Results

\[ y = -0.3521x + 23.952 \]

\[ R^2 = 0.1148 \]
Pretest Results

✓ 3 Courses – Pretest Scores increased.
   AGEC 4823       AGEC 4703
   AGEC 4803

✓ 5 Courses – Pretest Scores decreased.
   AGEC 2273       AGEC 4623
   AGEC 4683       AGEC 4713
   AGEC 4613

No $R^2 > .1148$ for any upper level course!
Posttest Results

✓ 5 Courses – Postest Scores increased.

<table>
<thead>
<tr>
<th>Course</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGEC 2273</td>
<td>.1964</td>
</tr>
<tr>
<td>AGEC 4703</td>
<td>.0041</td>
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<tr>
<td>AGEC 4683</td>
<td>.3937</td>
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<td>AGEC 4713</td>
<td>.2432</td>
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<tr>
<td>AGEC 4803</td>
<td>.5423</td>
</tr>
</tbody>
</table>

✓ 3 Courses – Postest Scores decreased.

<table>
<thead>
<tr>
<th>Course</th>
<th>R²</th>
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<tbody>
<tr>
<td>AGEC 4823</td>
<td>.1958</td>
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<tr>
<td>AGEC 4623</td>
<td>.1135</td>
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<tr>
<td>AGEC 4613</td>
<td>.0006</td>
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</tbody>
</table>
Increase Results

✓ 6 Courses – Positive Trendline.  
AGEC 2273  .3138  
AGEC 4703  .0008  
AGEC 4683  .1658  
AGEC 4713  .4709  
AGEC 4803  .5657  
AGEC 4613  .0225

✓ 2 Courses – Negative Trendline.  
AGEC 4823  .2030  
AGEC 4623  .0038
Combined Pretest Results

Decreasing Pretest Scores

2006  2007  2008  2009  2010  2011  2012  2013

2273
4623
4683
4613
4713
Conclusions

1. **Pretests**: More courses with declining scores than increasing.

2. **Posttests**: More courses with increasing scores than decreasing.

3. **Increases**: More courses with increasing scores than decreasing.

4. **Combined Pretests**: Mixed results.
Further Questions/Implications

1. AGEC 2273 offers greatest possibilities for improvement – Add study sessions?
2. Results skewed by small sample sizes?
3. Will pretests and posttests in other disciplines generate similar results?
4. Insights if combined with other measures?
Questions??