The Relationship Between In-Class Written Exercise and Exam Performance in an Allied Health Gross Anatomy Course
Experimental Design

- **Subjects**: 45 learners (PT, CRNA, SPFD) enrolled in summer Gross Anatomy course
- **Method**: Given 5-6 identical pre- and post-review lecture questions
  - 3 test blocks (upper limb, lower limb, head & neck)
  - Written responses
- **Analysis**: Correlation between pre/post exercise scores and exam scores
1. List 3 muscles that attach to the coracoid process.
2. List the spinal nerve segments in the nerve that innervates teres major.
3. List the 4 branches of the thoracoacromial artery.
4. List the nerve that innervates the brachialis muscle.
5. List the 3 muscles that externally (laterally) rotate the arm.
Exercises promote short-term knowledge acquisition
Pre-lecture exercise performance is moderately correlated with exam performance (*p<0.05, #p<0.01)

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<tbody>
<tr>
<td>Pre/Written</td>
<td>0.42#</td>
<td>0.40 #</td>
<td>0.33 *</td>
</tr>
<tr>
<td>Pre/Lab</td>
<td>0.55 #</td>
<td>0.19</td>
<td>0.20</td>
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<tr>
<td><strong>Pre/Avg</strong></td>
<td><strong>0.54 #</strong></td>
<td><strong>0.40 #</strong></td>
<td>**0.33 ***</td>
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<tr>
<td>Post/Written</td>
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<td>0.47 #</td>
<td>0.17</td>
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<tr>
<td>Post/Lab</td>
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<td>0.35 *</td>
<td>0.06</td>
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<tr>
<td>Post/Avg</td>
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<td>0.48 #</td>
<td>0.14</td>
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Pre-lecture exercise performance is a stronger predictor of exam performance than post-lecture exercise performance (*p<0.05, #p<0.01)

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<tr>
<td>Pre/Written</td>
<td>0.18 *</td>
<td>0.16 *</td>
<td>0.11 *</td>
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<tr>
<td>Pre/Lab</td>
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<td>0.11 *</td>
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<td>Post/Written</td>
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<tr>
<td>Post/Avg</td>
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<td>0.23 *</td>
<td>0.02</td>
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Student Survey Results

1. Exercises enhanced learning experience
2. Exercises helped me understand material
3. I’d like similar exercises in other lecture courses
4. Exercises made learning more active
5. Exercises had a positive effect on exam performance

Percent (%)

Exercises had an overall positive effect on learning experience for adult learners
Options for Faculty

• "Old school" – paper and pencil
  – Written exercises
    • PROs:
      – Forces learner to recall, not just recognize
      – Reinforces information through writing
    • CONs:
      – Takes time to “grade”
      – No instant learner/teacher feedback
      – Wastes paper

• "New school" – technology
  – Audience Response System (clickers)
    • PROs:
      – Can easily simulate exam-type multiple choice questions
      – Quick feedback, easy analysis
    • CONs:
      – Easy to guess/recognize, but may not enhance recall
      – Cost
The Brody School of Medicine welcomed its first class in:

A. 1970
B. 1964
C. 1968
D. 1977
E. 1980

20% 20% 20% 20% 20%
Questions?