Part III- Using the ASBOG® Fundamentals of Geology (FG) Examination as a Geosciences Program Assessment and Modification Tool
History of ASBOG’s Academic Assessment

• **2008**- Special Committee on Education and Outreach formed to evaluate the use of the FG for academic assessment

• **2008**- FG scantron (bubble sheet) was modified to collect demographic data for academic assessment
  
  – Including AGI code for undergraduate institution
  
  – Year of graduation
  
  – Highest degree
  
  – Area of specialization
History of ASBOG’s Academic Assessment

• **2010** - Assessment letter sent to academic departments with geosciences programs; $$ for assessment data 😞
• **2012** - Education and Outreach Committee renamed Academic Assessment Committee
• **2012** - Developed CPAT for comparing geoscience programs to a national statistical data
• More than 215 universities/schools eligible for CPAT (>10 exams in CPAT database)
• Currently 42 universities using CPAT
Top 12 Universities by FG Examination Volume

1. Western Washington University
2. University of Mississippi
3. University of West Georgia
4. University of South Florida - Tampa
5. University of Alabama - Dept of Geological Sciences
6. California State University - Sacramento
7. University of Southern Mississippi - Dept of Geology
8. University of Texas - Austin - Jackson School of Geosciences
9. University of California - Davis (Dept of Geology)
10. San Diego State University
11. University of California - Santa Cruz
12. Texas A&M University - Dept of Geology and Geophysics
More than 72% of all candidates taking the Fundamentals of Geology (FG) examination are graduating seniors (no degree) and/or B.A./B.S. graduates; allowing for the use of this national examination for undergraduate program review, program modification and curriculum assessment.

- No Degree (n= 512): 4.6%
- B.A./B.S. (n= 7575): 67.8%
- M.A./M.S. (n= 2834): 25.4%
- Ph.D./D.Sc. (n= 249): 2.2%
Using the FG as an Assessment Tool

✓ **Regional Accreditation and Program Review**
  *i.e.*, Middle States Commission on Higher Education, New England Association of Schools and Colleges (NEASC), Northwestern Commission on Colleges and Universities (NWCCU), Higher Learning Commission (HLC), **Southern Association of Colleges and Schools (SACS)**, and Western Association of Schools and Colleges (WASC)

✓ **Curriculum Development**

✓ **Curriculum Assessment**

✓ **Curriculum Modifications**

✓ **Exit Exam vs. Assessment Exam?**
Curriculum Performance Assessment Tool (CPAT)

- Virtual demonstration of CPAT
Curriculum Performance Assessment Tool (CPAT)

- Virtual demonstration of CPAT
Curriculum Performance Assessment Tool (CPAT)

- Virtual demonstration of CPAT

Z-Scores & Percentiles

% Passing by Degree Year

Scaled vs % Correct
Curriculum Performance Assessment Tool (CPAT)

- Virtual demonstration of CPAT
Using Z-Scores

<table>
<thead>
<tr>
<th>Domain Areas</th>
<th>Z-Score (+/-) Standard Deviation</th>
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<tbody>
<tr>
<td>Geomorphology</td>
<td>-1.36</td>
</tr>
<tr>
<td>Structure</td>
<td>-1.06</td>
</tr>
<tr>
<td>Engineering</td>
<td>-0.97</td>
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<tr>
<td>Hydrogeology</td>
<td>-0.28</td>
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<tr>
<td>Mineralogy</td>
<td>-0.18</td>
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<tr>
<td>Sedimentology</td>
<td>-0.17</td>
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<tr>
<td>General</td>
<td>-0.04</td>
</tr>
<tr>
<td>Economic</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Significant Z-Score Difference

No Significant Z-Score Difference
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Using the FG as an Assessment Tool

University of West Georgia Model

✓ Each graduating senior is required to take the FG examination as part of our capstone course
✓ Students pay for the cost of the exam as part of their lab/activity fees, but are reimbursed if they pass the exam
✓ Passing scaled score of 70%...determines national “minimum competency”
✓ Students are asked to share their exam statistics with the department, but are not required
✓ Department assesses the exam statistics to see if curriculum modifications are deemed necessary (i.e., 2014 modifications)
✓ If curriculum changes are made, the success or failure of these changes is assessed with results of future results of exam administrations
University of West Georgia Model

**University of West Georgia Assessment and Curriculum Changes:**

Based on analysis of FG CPAT data-

- **Economic Geology** was added to the Geology curriculum and required (January 2014)
- **Hydrogeology** is now a required course (January 2014)
- **Engineering Geology** is a highly suggested upper division elective
- **Mineralogy and Crystallography** will add an additional component to support Economic Geology
- **Plate Tectonics** became an elective
- **Geomorphology** is a suggested as an upper division elective
- **Field Geology and Geologic Mapping** will integrate site investigations into the course content.

All of these changes were made in January 2014…performance on the FG exam starting in 2015 showed an improvement in Economic Geology and Hydrogeology scores. An assessment success!
Central Michigan University (CMU) Model

• CMU Model for *non-member States*
  – Allow use FG for academic assessment
  – Pay a per administration access fee, similar to other non-member states
  – Does not have the benefits of an ASBOG® member state
  – Will not be using the PG examination
  – Will not be issuing licenses

• CMU Model for *member States*
  – State Boards to allow university testing centers for proctoring of FG and PG examinations
  – Who better to proctor examinations than accredited testing centers
  – Allow for broader geographic distribution within a state
  – Many State testing centers are *not* equipped for CBT; university testing centers already have all the infrastructure needed; as ASBOG® transitions to CBT...seamless (?)
  – Testing, access and application fees...who gets the $$
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