Calls for Reform: The Carnegie Report and Anatomy Education

Bridget C. O’Brien, PhD

Anatomy Education Breakfast Roundtable
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Flexner’s Legacy

- High standards for admission
  - College degree with science requirements
- Expanded science-based curriculum
  - Two years basic sciences
  - Two years clinical experience
- University/teaching hospital

Medical Education Then and Now

- 1910 -
  - Dissection session
- 2010 -
  - Multi-disciplinary lab with media support

The Carnegie Research Team

2010 Carnegie Study

- Part of 5 profession study
- Included 14 site visits
- Based on research in the learning sciences and medical education
Four Recommendations

- Standardization and individualization
  - Set performance outcomes and allow flexibility in learning processes
- Integration
  - Connect knowledge and skills across disciplines, experiences & professions
- Habits of inquiry and improvement
  - Create learning environments that encourage deep-learning and reinforce improvement as a continuous goal
- Identity formation
  - Develop professional values and dispositions

Standardization: 1910 Mapping Medical Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Western Reserve</th>
<th>NYU</th>
<th>U AB</th>
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<tbody>
<tr>
<td>Anatomy</td>
<td>96 (lec)</td>
<td>0</td>
<td>14 (lec)</td>
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<tr>
<td>Path</td>
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<td>Medicine</td>
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<td>192 (clin) 256 (lec)</td>
<td>112 (clin) 56 (lab) 84 (lec)</td>
</tr>
</tbody>
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Mapping Competencies and Milestones - Mayo

- Communication & Professionalism
  - Learn oral communication through interactions with peers and faculty
- Clinical Skills
  - Learn to evaluate x-rays, CT scans, MRI images
- Anatomical Knowledge
  - Learn gross anatomy through dissection, radiologic imaging, embryologic correlation

Individualization

- Pedagogies
  - Individual learning plans, peer teaching, team based learning
- Learner resources
  - Independent learning modules, computer assisted learning
- Curriculum
  - Electives, pathways

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Integration

- Connect knowledge and skills across disciplines
- Connect knowledge and practical experience
- Engage in multiple forms of reasoning
  - Pattern recognition
  - Analytical reasoning
  - Adaptive & creative thinking
- Create synergies across fields / professions & levels of learner

Strategies for Integrating

- Connect cases, physical exam and procedural skills, imaging, anatomy across curriculum, including in practice
- Bring learners together from different fields / professions to share and enhance their expertise

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Habits of Inquiry and Improvement

- Advance expertise through deliberate practice & feedback
  - Experts vs experienced non-experts
- Participate in learning environments that build knowledge and strive to improve
- Develop habits of learning and inquiry
  - Balance efficiency and innovation

Developing skills for IMPROVEMENT

- Routine expertise
  - Focuses on efficiency and mastery of knowledge and skills
- Adaptive expertise
  - Focuses on problem solving and finding innovative solutions
- Both learned over time

Inquiry and Improvement

- Framing anatomy as discovery
- Focusing on knowledge building and problem solving rather than knowledge mastery
- Engaging learners in continuous innovation and improvement
  - Curricular and instructional redesign
- Support learner scholarship and elective pathways

From: Schwartz, Bransford, & Sears. 2005. Transfer of Learning from a Modern, Multidisciplinary Perspective; p.38
Question: Why don’t students know enough anatomy?

- Fragmented learning & lack of common core curriculum
- Insufficient teaching in context
- Lack of true vertical integration
  - Unidirectional
- Assessment strategies conducive to memorization
  - Allow surface vs. deep-learning


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Identity Formation

- Formation
  - Process of taking on identity
  - Commitment to values, dispositions and aspirations
- Learned through
  - Participation in a community of practice
  - Observation of role models, interactions
  - Coaching, instruction, assessment and feedback

Strategies for Formation

- Reflecting on professionalism
  - Informed reflection, portfolios
- Assessing professionalism
  - Observation and feedback
  - Ratings of respect
- Creating a culture of professionalism
  - First teamwork experiences

Institutional Culture

Roundtable Discussion

- We will assign your table 1 of the 4 recommendations
- ~20min to discuss specific questions
- ~15min to discuss general questions
- Remaining time to share ideas, ask questions, large group discussion

Summary

Indebted to Flexner but must move beyond
1. Standardize on outcomes and individualize the learning process
2. Integrate knowledge and experience
3. Develop habits of inquiry and improvement
4. Focus on professional identity formation

In-depth discussion on identity formation, strategies for formation, institutional culture.