Preparing the Next Generation of the Graduate Workforce: Using Holistic Review to Achieve Diversity, Innovation & Excellence

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Agenda

- Analyze the urgency driving the need for diversifying the scientific workforce
- Define holistic review
- Describe the core principles of holistic review
- Review outcomes of holistic review
"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things."

- Niccolo Machiavelli, The Prince
Demographic Profile of Graduate Enrollment by Race/Ethnicity

- GS enrolled in U.S. = 611,600 (2009)

- URM accounted for 12% vs. 48% Whites
  - 6-7% in S&E fields*
  - 9-10% agricultural and biological sciences
  - 15% medical & other life sciences
  - 17% social sciences
  - 19% psychology

NSB, NCSES, January 2012
Demographic Profile of Graduate Degrees by Race/Ethnicity: Master’s Degrees

Figure 2-18
S&E master's degrees, by race/ethnicity and citizenship: 2000–09

Thousands

NOTE: Data on race/ethnicity include U.S. citizens and permanent residents.
Demographic Profile of Graduate Degrees by Race/Ethnicity: Doctoral Degrees
TOTAL U.S. POPULATION, 2011

- **White, Non-Hispanic, 65%**
- **Hispanic, 17%**
- **Black, Non-Hispanic, 12%**
- **Other, 6%**

Total U.S. Population: 307.9 Million

Kaiser Commission, 2013
Demographics

TOTAL CALIFORNIA POPULATION, 2011

- White, Non-Hispanic, 39.6%
- Hispanic, 38.0%
- Black, Non-Hispanic, 6.6%
- Other, 15.5%

Total CA Population: 37.6 Million

U.S. Census Bureau, 2012
## UCDHS Surrounding Counties Demographic Data

### Primary Counties Demographics Profile

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Placer County</th>
<th>SAC County</th>
<th>Yolo County</th>
<th>Amador County</th>
<th>Contra Costa</th>
<th>El Dorado County</th>
<th>San Joaquin</th>
<th>Solano County</th>
<th>Sutter County</th>
<th>Napa County</th>
<th>Nevada County</th>
<th>Sierra County</th>
<th>Yuba County</th>
<th>Regional Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>78.55%</td>
<td>53.51%</td>
<td>54.38%</td>
<td>87.63%</td>
<td>51.21%</td>
<td>81.78%</td>
<td>40.43%</td>
<td>44.50%</td>
<td>54.16%</td>
<td>59.33%</td>
<td>88.26%</td>
<td>93.24%</td>
<td>61.71%</td>
<td>54.73%</td>
</tr>
<tr>
<td>Black or African American</td>
<td>1.31%</td>
<td>9.02%</td>
<td>2.15%</td>
<td>0.15%</td>
<td>8.47%</td>
<td>0.72%</td>
<td>6.43%</td>
<td>13.03%</td>
<td>1.68%</td>
<td>1.51%</td>
<td>0.35%</td>
<td>1.13%</td>
<td>2.33%</td>
<td>7.01%</td>
</tr>
<tr>
<td>All Asians</td>
<td>6.05%</td>
<td>14.99%</td>
<td>12.11%</td>
<td>1.79%</td>
<td>15.30%</td>
<td>3.70%</td>
<td>14.50%</td>
<td>16.53%</td>
<td>14.08%</td>
<td>6.98%</td>
<td>1.18%</td>
<td>0.23%</td>
<td>6.70%</td>
<td>13.14%</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.70%</td>
<td>0.59%</td>
<td>0.61%</td>
<td>1.11%</td>
<td>0.28%</td>
<td>0.87%</td>
<td>0.48%</td>
<td>0.39%</td>
<td>0.84%</td>
<td>0.40%</td>
<td>0.74%</td>
<td>0.00%</td>
<td>1.20%</td>
<td>0.51%</td>
</tr>
<tr>
<td>Other and/or Two+ Races</td>
<td>1.81%</td>
<td>3.11%</td>
<td>2.56%</td>
<td>2.07%</td>
<td>2.37%</td>
<td>2.78%</td>
<td>2.55%</td>
<td>4.02%</td>
<td>1.62%</td>
<td>2.21%</td>
<td>1.87%</td>
<td>0.00%</td>
<td>4.56%</td>
<td>2.82%</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>11.59%</td>
<td>18.77%</td>
<td>28.14%</td>
<td>6.80%</td>
<td>22.04%</td>
<td>10.76%</td>
<td>35.63%</td>
<td>21.56%</td>
<td>25.95%</td>
<td>30.14%</td>
<td>7.56%</td>
<td>6.25%</td>
<td>23.49%</td>
<td>21.79%</td>
</tr>
</tbody>
</table>


Source: www.dof.ca.gov/research/demographic; Civilian Labor Force (> or = 18 years of age); California Department of Finance, EEO Data
Benefits of Diversity

- **Educational** benefits → robust learning environs
- **Research** benefits → more productive, creative, innovative; higher lever of critical analysis of complex problems
- **Science and technology** benefits → global leadership & competitiveness
- **Relationship** benefits → patient preference
- **Service commitment** benefits → service to the underserved
- **Representative** workforce benefits → trustworthiness

Herring, 2009; Chang et al., 2003; ACE and AAUP, 2000; McLeod, Lobel & Cox, 1996; Nemeth, 1995; 1985; 1986; Schulz-Hardt et al, 2006; Sommers, 2006; Antonio et al, 2004; Milem, Chang, 2003; Saha et al, 2006, 2013;
"The significant problems we face cannot be solved at the same level of thinking we were at when we created them."

- Albert Einstein
Purpose of Holistic Review

1. Develop **mission-centered**, admissions-related tools and resources → create and sustain diversity.

2. **Catalyst** for thinking differently.

3. **Institutional change**
Purpose of Holistic Review

4. Assess the **alignment**
   - Institution’s **mission and goals**
   - **Criteria** used for **selection** applicants
   - Attributes, attitudes, and skills **fostered** and rewarded

5. Identify potential **leverage points** for enacting change
Definition of Holistic Review

- **Holistic review** is a flexible, individualized way of assessing an applicant's capabilities by which *balanced* consideration is given to *experiences, attributes, and academic metrics* and, when considered in combination, how the individual might contribute *value* as a medical student and physician.
Definition of Holistic Review

- **Holistic review** is a flexible, individualized way of assessing an applicant's capabilities by which balanced consideration is given to experiences, attributes, and academic metrics and, when considered in combination, how the individual might contribute value as a **graduate student** and **future research scientist**.
Four Core Principles of a Holistic Admissions Process

1. Selection criteria = broad-based, linked to school's mission and goals, and promote diversity
2. Balance of Experiences-Attributes-Metrics (E-A-M)
Four Core Principles of a Holistic Admissions Process

1. Selection criteria = broad-based, linked to school's mission and goals, and promote diversity
2. Balance of E-A-M
3. Consideration how each individualized applicant will contribute to the learning environment & to the profession
Desired Personal Competencies for Entering Medical Students

- **Interpersonal competencies**
  - Service orientation, social skills, cultural competence, team work, oral communication

- **Intrapersonal competencies**
  - Ethical responsibility to self and others, reliability & dependability, resilience and adaptability, capacity for improvement

- **Thinking and reasoning competencies**
  - Critical thinking, quantitative reasoning, scientific inquiry, written communication

- **Science competencies**
  - Living systems, human behavior

Mahan KE et al, Acad Med, 2013
Four Core Principles of a Holistic Admissions Process

1. Selection criteria = broad-based, linked to school's mission and goals, and promote diversity
2. Balance of E-A-M
3. Consideration how each individualized applicant will contribute to the learning environment & to the profession
4. Race-ethnicity may be considered to achieve mission-related educational interests and goals, and considered as a broader mix of factors
"Once we rid ourselves of traditional thinking we can get on with creating the future."

- James Bertrand
Urban Universities for HEALTH Learning Collaborative Report 2014

- Partnership of the Association of Public and Land-Grant Universities/Coalition of Urban Serving Universities, and Association of American Medical Colleges

- Aim: Improve evidence around university efforts that lead to a more diverse, culturally competent and prepared workforce...
Urban Universities for HEALTH Learning Collaborative Report 2014

- Methodology: Survey instrument (46 questions) – use of holistic admissions process and outcomes

- N = 104 universities in 45 states (response rate 64%)
  - 228 individual health professions schools completed survey
    - 66 nursing schools
    - 44 medical schools
    - 43 dental schools
    - 39 schools of public health
    - 36 pharmacy schools
## Holistic Review: Impact on Diversity

<table>
<thead>
<tr>
<th>Diversity of the Incoming Class</th>
<th>Increased</th>
<th>Unchanged</th>
<th>Decreased</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools using many holistic review elements (n=57)</td>
<td>81%</td>
<td>16%</td>
<td>4%</td>
</tr>
<tr>
<td>Schools using some holistic review elements (n=60)</td>
<td>67%</td>
<td>32%</td>
<td>2%</td>
</tr>
<tr>
<td>Schools using few to no holistic review elements (n=15)</td>
<td>60%</td>
<td>40%</td>
<td>0%</td>
</tr>
<tr>
<td>Total Schools using holistic review (n=132)</td>
<td>72%</td>
<td>26%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Glazer B, Bankston K, 2014
Holistic Review: Student Success Measures

Incoming Class Academic Measures

Average GPA of the Incoming Class (n=136)

- Increased: 38
- Unchanged: 52
- Decreased: 10

Glazer B, Bankston K, 2014
Holistic Review: Student Success Measures

Incoming Class Academic Measures

- Average GPA of the Incoming Class (n=136)
  - Increased: 38%
  - Unchanged: 52%
  - Decreased: 10%

- Average Standardized Test Score of Incoming Class (n=127)
  - Increased: 41%
  - Unchanged: 48%
  - Decreased: 11%

Glazer B, Bankston K, 2014
Holistic Review: Student Success Measures

Student Academic Performance

Average GPA of the Graduating Class (n=79)

- Increased: 29%
- Unchanged: 68%
- Decreased: 2.5%

Glazer B, Bankston K, 2014
Holistic Review: Student Success Measures

Student Retention

Graduation Rate (n=104)
- Increased
- Unchanged: 80
- Decreased: 16, 4

Glazer B, Bankston K, 2014
Summary

- Holistic review for admissions may be an effective modality to help enhance the diversity of our institutional student body and future workforce.

- Does not seem to have a significant impact on
  - Academic success measures of students being enrolled
  - Student academic performance
  - Graduation rates
Resources
Graduate Programs & Holistic Review

- University of Michigan Rackham Graduate School
- UCLA
- University of Minnesota
- University of Texas at Austin
American Association for the Advancement of Science

AAMC Holistic Review
https://www.aamc.org/admissions/admissionslifecycle/411494/evalholisticreview.html

Roadmap to Diversity: Integrating Holistic Review Practices into Medical School Admission Processes
Chapter 2. Higher Education in Science and Engineering

Graduate Education, Enrollment, and Degrees in the United States

Graduate education in S&E contributes to global competitiveness, producing the highly skilled workers of the future and the research needed for a knowledge-based economy. In 2009, the Council of Graduate Schools and the Educational Testing Service formed a joint commission to investigate how graduate education can meet the challenges of the 21st century (see sidebar "The Path Forward: The Future of Graduate Education in the United States").

This section includes indicators related to graduate enrollment, recent trends in the number of earned degrees in S&E fields, and participation by women, minorities, and foreign students in graduate education in U.S. academic institutions.

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Graduate Enrollment in S&E

There were 611,600 S&E graduate students enrolled in the United States in fall 2009; 48% of them were women (appendix table 2-20). The proportions of women graduate students enrolled in S&E differed considerably by field, with the lowest proportions in engineering (22%), computer sciences (26%), and physical sciences (33%). Women constituted the majority of graduate students in psychology (76%), medical/other life sciences (76%), biological
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