Introducing and Implementing the New ACS Guidelines for Chemistry in Two-Year College Programs

Northwest Regional Meeting
Tacoma, WA
June 28—July 1, 2009

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Pursuing Excellence

Requires:

- Establishing a vision of excellence
- Maximizing the potential of
  - Students
  - Faculty
  - Programs
- Leveraging efforts
- Making strategic investments

Establishing a Vision of Excellence

Disciplinary guidelines foster the pursuit of excellence by providing:

- A comprehensive model designed for a range of institutions
- A framework for reviewing disciplinary programs
- Help in identifying areas of strength and opportunities for change
- Opportunity to leverage support from institutions, partners, and external agencies

Establishing a Vision of Excellence: An Example

The revision of the *ACS Guidelines for Chemistry Programs in Two-Year Colleges* seeks to

- Reflect changes in pedagogy, technology, accountability
- Facilitate student transfer
  - by aligning with the new *ACS Guidelines and Evaluation Procedures for Bachelor's Degree Programs*
  - by calling for communicating with receiving institutions
- Provide a more useful resource for strengthening programs
  - by offering guidance for ongoing curricular change
  - by offering guidance for improving the working environment

Establishing a Vision of Excellence: An Example

The revision of the *ACS Guidelines for Chemistry Programs in Two-Year Colleges* is intended to:

- Stimulate faculty, departments and administrators by providing a vision of excellence in chemistry education for the first two years of college.
- Provide a resource for self-evaluation and ongoing improvement of chemistry education in two year colleges.
- Serve as a call for collaborative action for all stakeholders to improve chemistry education in the first two years of college.

Maximizing the Potential of Students

Students in excellent two-year college [chemistry] programs:

- Gain intellectual, experimental, and professional skills needed to be successful and scientifically-informed citizens, as well as contributors to the scientific enterprise.
- Are grounded in the [molecular] perspective of [chemistry].
- Are encouraged to extend their understanding through the basic principles of the scientific method.
- Develop the ability to apply knowledge and skills to new situations and to transfer knowledge from one context to another.

Maximizing the Potential of Students (cont.)

Excellent two-year college [chemistry] programs have curricula that:

- Deliver content in ways that are challenging, engaging, and inclusive.
- Accommodate a variety of learning styles.
- Use innovative and stimulating pedagogy.
- Include integrative experiences.

Maximizing the Potential of Students (cont.)

Students in excellent two-year college [chemistry] programs have:

- Hands-on laboratory experiences that involve
  - [synthesis of molecules and
  - measurement of chemical properties and phenomena].
- Opportunities to search and use the [chemical] literature and scientific databases and to employ computer modeling.
- Opportunities to pursue original research projects that result in comprehensive written reports.
- Interactions with faculty that provide effective mentoring and feedback.

Maximizing the Potential of Students (cont.)

Excellent two-year college [chemistry] programs produce students who:

- Ask questions, design experiments, and interpret results based on current scientific information.
- Work safely in the laboratory.
- Demonstrate effective oral and written communication.
- Work effectively as a member of a team.
- Exhibit ethical scientific conduct.
- Develop behaviors and thought patterns leading to innovation and a capacity for lifelong learning.

Maximizing the Potential of Faculty

Faculty in excellent two-year college [chemistry] programs:

- Are energetic and accomplished [chemistry] faculty.
- Maintain their professional competence at a level that reflects the current state of the discipline.
- Receive feedback and support regarding teaching, professional scholarship, and service as appropriate to the institutional mission.

Maximizing the Potential of Faculty (cont.)

Faculty in excellent two-year college [chemistry] programs:

- Determine the overall goals of the [chemistry] program within the context of the institutional mission and student body.
- Define the student outcomes and are the facilitators for student learning of content knowledge and process skills in [chemistry].
- Are significantly engaged in the educational mission of the department and institution.

Maximizing the Potential of Programs

Excellent two-year college [chemistry] programs have:

- Mechanisms for faculty development, faculty mentoring, and development of faculty leadership.
- Safe, well-designed facilities, equipped with current instrumentation, and supported by appropriate non-faculty staff.
- On-going strategic planning to ensure that the infrastructure supports high quality student experiences and accommodation of new initiatives.

Maximizing the Potential of Programs (cont.)

Excellent two-year college [chemistry] programs have:

- High levels of communication and coordination with administrators, faculty in other programs, counselors and advisors, and staff providing a range of support services.
- Regular interactions with other academic institutions and organizations that leverage resources and expertise, helping programs achieve their goals.
- Regular, transparent and reflective self-evaluation processes that lead to continued improvement.

Leveraging Efforts

Faculty can:

- Pursue professional growth activities.
- Be actively involved in professional organizations.
- Interact with colleagues in other disciplines and campus units, communicating student needs and sharing strategies.
- Pursue internal and external partnerships.
- Share disciplinary guidelines with colleagues and potential partners.

Leveraging Efforts

Departments can:

- Invite adjunct faculty to participate in department activities.
- Hold regular faculty meetings for sharing teaching strategies and curricular review.
- Help ease articulation process for all transfer students, especially minority students.
- Use disciplinary guidelines for self-evaluation.
- Use disciplinary guidelines to validate efforts and advocate for resources.

Leveraging Efforts

Administrators can:

- Provide faculty financial support for professional development.
- Provide faculty development activities to help faculty respond to new pedagogy/technology techniques.
- Help ease articulation process for all transfer students, especially minority students.
- Use disciplinary guidelines to validate efforts and advocate for resources.

Making Strategic Investments

Two-year colleges are attracting a growing and increasingly diverse number of students.

- From 1990 to 2005, full- and part-time enrollments at two-year institutions rose from 5.2 to 6.5 million.
- From 1990 to 2005, underrepresented minorities attending two-year institutions rose from 1.2 to 2.4 million.

National Center for Education Statistics. 2008. Digest of Education Statistics, 2007. Table 217. Washington D.C.: U.S. Department of Education.

Making Strategic Investments

Graduates (bachelor's and master's in 1999 and 2000) attending community college:

- 44% overall
- 37% physical and related sciences
- 40% engineering
- 42% computer and math sciences
- 45% social and related sciences
- 46% life and related sciences

John Tsapogas, "The Role of Community Colleges in the Education of Recent Science and Engineering Graduates", *NSF InfoBrief*, April 2004.

Making Strategic Investments

The students who diversify the science and engineering workforce are attending community colleges at some point in their educational paths

- 44% of all recent science and engineering (S&E) graduates (bachelor's and master's)
- 51% of Hispanic S&E graduates
- 45% of American Indian/Alaskan Natives S&E graduates
- 44% of black S&E graduates

John Tsapogas, "The Role of Community Colleges in the Education of Recent Science and Engineering Graduates", *NSF InfoBrief*, April 2004.

Goals of the Recent Revision

- Reflect changes in pedagogy, technology, accountability
- Facilitate student transfer
  - by aligning with the new *ACS Guidelines and Evaluation Procedures for Bachelor's Degree Programs*
  - by calling for communicating with receiving institutions
- Provide a more useful resource for strengthening programs
  - by offering guidance for ongoing curricular change
  - by offering guidance for improving the working environment

History of ACS Guidelines for Two-Year Colleges

- 1970 - Guidelines for Chemistry Programs in Two-Year Colleges - First Edition
- 1988 - Guidelines for Chemistry and Chemical Technology Programs in Two-Year Colleges
- 1991 - Establishment of the Chemical Technology Program Approval Service (CTPAS)
- 1997 - Guidelines for Chemistry Programs in Two-Year Colleges - Second Edition
- 2009 - Guidelines for Chemistry in Two-Year College Programs - third edition with a new name

Acknowledgements

Society Committee on Education (SOCED) Task Force on the ACS *Guidelines for Chemistry Programs in Two-Year Colleges*

- Dolores Aquino
  - San Jacinto College Central, TX (CHED Committee on Chemistry at Two-Year Colleges)
- Carlos Gutierrez
  - California State University-Los Angeles (Committee on Professional Training)
- Tom Higgins
  - Harold Washington College, IL (Committee on Minority Affairs)
- David Malik
  - Indiana University Purdue University-Indianapolis
- Doug Sawyer
  - Scottsdale Community College, AZ
- Uni Susskind
  - Oakland Community College, MI (College Chemistry Consultants Service)

Revisions to the Guidelines

- Alignment of sections with guidelines for Bachelor's programs (order and content, as appropriate)
- Inclusion of sections on
  - transfer students
  - undergraduate research
  - student skills
  - student mentoring and advising
  - program self-evaluation
  - partnerships
- Emphasis on professional development
- Vision of excellence

Organization of the Guidelines

1. Goals of Guidelines
2. Institutional Environment
3. Faculty and Staff
4. Infrastructure
5. Curriculum
6. Student Research and Scholarly Activities
7. Development of Student Skills
8. Student Mentoring and Advising
9. Program Self-Evaluation and Assessment
10. Partnerships

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