Society Committee on Education (SOCED)
Agenda Book
Confidential and Proprietary

Spring 2022 Hybrid Committee Meeting

Friday, March 18, 2022
8:00 am – 11:15 am (PDT)
American Chemical Society  
Society Committee on Education  
Hybrid (virtual and in-person) Meeting

Join Zoom Meeting  
https://american-chemical-society.zoom.com/j/89320674496?pwd=dFVqd1hpZm4vZm1Xb3IeVAwci94dz09

Meeting ID: 893 2067 4496  
Password: 166610
One tap mobile  
+13017158592, 89320674496# US (Washington DC)  
+13126266799, 89320674496# US (Chicago)

Thursday, March 17, 2022  
All meetings are scheduled in (PDT) and will be held in the Hilton  
San Diego Bayfront Hotel

<table>
<thead>
<tr>
<th>Time (PDT)</th>
<th>Topic</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:00 pm – 7:00 pm</td>
<td>SOCED Reception (in-person only)</td>
<td>Indigo 202A</td>
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Friday, March 18, 2022

<table>
<thead>
<tr>
<th>Time (PDT)</th>
<th>Topic</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00 am – 11:15 am</td>
<td>SOCED Full Committee Meeting</td>
<td>Aqua Salon C/D</td>
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<tr>
<td>11:30 am – 1:45 pm</td>
<td>CPT/SOCED Joint Luncheon (in-person only)</td>
<td>Aqua Salon 300</td>
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<tr>
<td>2:30 pm – 4:00 pm</td>
<td>SOCED subcommittee meetings</td>
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<td></td>
<td>• Supporting Excellence in Education</td>
<td>Aqua Salon 300A</td>
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<td>• Student Communities</td>
<td>Aqua Salon E</td>
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<td>• Science Education Policy</td>
<td>Indigo 206</td>
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<tr>
<td>Time</td>
<td>Topic</td>
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<tr>
<td>7:30 am</td>
<td>Breakfast</td>
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<tr>
<td>8:00 am</td>
<td>Welcome, Introductions, and Diversity, Equity, Inclusion, and Respect Moment</td>
<td>1, 2, 3</td>
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<tr>
<td>8:15 am</td>
<td>Approval of Minutes from Fall 2021 Meeting</td>
<td>4</td>
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<tr>
<td>8:20 am</td>
<td>Chair’s Report <em>(Information and Action)</em></td>
<td>5</td>
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<tr>
<td></td>
<td>Carmen Gauthier, SOCED Chair, will provide written and/or oral updates on:</td>
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<td></td>
<td>• Executive Committee actions</td>
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<td></td>
<td>• Joint efforts with CPT</td>
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<td>• ACS Fellows Nomination</td>
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<td></td>
<td>• SOCED Budget</td>
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<td></td>
<td>• ACS Spring 2022 meeting events</td>
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<td></td>
<td>• Special Projects</td>
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<td></td>
<td>• Chemistry Festivals</td>
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<td></td>
<td>• ACS staff reorganization</td>
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<tr>
<td>8:35 am</td>
<td>SOCED Strategic Plan Implementation <em>(Information and Action)</em></td>
<td>2</td>
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<tr>
<td></td>
<td>Mike Adams, SOCED Vice-Chair, will share updates on the strategies that are still in progress. SOCED will be asked to approve the extension of the 2019-2021 SOCED Strategic Plan by one additional year. Initial plans for 2023 and beyond will be discussed.</td>
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<tr>
<td>8:45 am</td>
<td>Committee on Committees <em>(Information and Action)</em></td>
<td>6</td>
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<tr>
<td></td>
<td>Diane Krone, ConC liaison to SOCED, will share information about the new Committee Preference Form, review the committee appointment process and the 2022 calendar, and encourage participation in the 2022 ConC National Committee Census.</td>
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<tr>
<td>9:00 am</td>
<td>Break</td>
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<tr>
<td>9:10 am</td>
<td>Reports from Liaisons <em>(Information)</em></td>
<td>7</td>
</tr>
<tr>
<td>9:15 am</td>
<td>Supporting Excellence in Education Subcommittee Report <em>(Information and Discussion)</em></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Tracy Halmi, subcommittee chair, will provide highlights of activities and subcommittee discussions requiring full committee consideration.</td>
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<tr>
<td>9:35 am</td>
<td>Student Communities Subcommittee Report <em>(Information and Discussion)</em></td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Matt Mio, subcommittee chair, will provide highlights of activities and subcommittee discussions requiring full committee consideration.</td>
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<tr>
<td>9:55 am</td>
<td>Break</td>
<td></td>
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<tr>
<td>10:05 am</td>
<td>Science Education Policy Subcommittee Report <em>(Information and Discussion)</em></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Laura Pence, subcommittee chair, will provide highlights of activities and subcommittee discussions requiring full committee consideration.</td>
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<tr>
<td>10:35 am</td>
<td>Special Discussion – Academic Integrity</td>
<td>11</td>
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<tr>
<td>Time</td>
<td>Item</td>
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<tr>
<td>11:10 am</td>
<td>New Business</td>
<td></td>
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<tr>
<td>11:15 am</td>
<td>Adjourn</td>
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The full committee will be updated on subcommittee considerations of ways ACS can foster academic integrity, providing additional input.
PLEASE NOTE: In the event of governance meetings taking place virtually or hybrid, guidance on the meeting schedule and reimbursement of expenses will be determined by the Committees who have purview over these areas.

<table>
<thead>
<tr>
<th>Committee</th>
<th>Committee on Education (SOCED)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Society Committee (Appointed by the President and Board Chair)</td>
</tr>
<tr>
<td>Mission Statement</td>
<td>The mission of the Society Committee on Education is to develop and implement policies and resources to advance chemistry education and to connect its diverse communities.</td>
</tr>
<tr>
<td>Normal Meeting Schedule</td>
<td>Semiannually, prior to each national meeting. Generally meets all day Friday prior to the meeting week. Virtual meetings are held 3-4 times per year in between national meetings.</td>
</tr>
<tr>
<td>Reimbursement Policy</td>
<td>Transportation, hotel and meal expenses are reimbursable for events/meeting associated with SOCED business with receipts up to a maximum not to exceed $1434 per meeting. ACS Spring and Fall meeting registration is a reimbursable expense. For meetings held separately, full reimbursement of all members, associates, and consultants is provided. The Councilors Travel Expense Program provides funds for members, associates, and consultants who are Councilors. The staff liaison can provide additional information, if needed.</td>
</tr>
</tbody>
</table>
| Staff Liaison              | LaTrease E. Garrison  
|                            | Chief Operating Officer  
|                            | Tel: 202-872-6150  
|                            | Email: l_garrison@acs.org |
| Committee on Committees Liaison | Diane Krone |
American Chemical Society

SOCIETY COMMITTEE ON EDUCATION

2022 Expense Reimbursement Policy
Please note that this policy covers the full committee and its subcommittees. Subgroups are not covered by this policy.

<table>
<thead>
<tr>
<th></th>
<th>Members/Associates/</th>
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<tbody>
<tr>
<td></td>
<td>Voting Councilors</td>
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<tr>
<td>Members/Associates/</td>
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<tr>
<td>Consultants Who Are</td>
<td>Not Voting</td>
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A. Committee/Subcommittee Sessions
   at ACS Spring and Fall Meetings

<table>
<thead>
<tr>
<th></th>
<th>No*</th>
<th>Yes (actual cost)</th>
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<tbody>
<tr>
<td>Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per diems: Committee executive session</td>
<td>**</td>
<td>usually Friday</td>
</tr>
<tr>
<td>Per diems: Subcommittee meetings</td>
<td>**</td>
<td></td>
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<tr>
<td>Per diems: Committee open meeting</td>
<td>No.</td>
<td>No.</td>
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<tr>
<td>Per diems: Remainder of ACS Spring/Fall Meeting</td>
<td>No.</td>
<td>No.</td>
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<tr>
<td>Meeting registration fee</td>
<td>No*</td>
<td>Yes</td>
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B. Committee Sessions Elsewhere

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<thead>
<tr>
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<th>Yes</th>
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<tr>
<td>Transportation</td>
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<tr>
<td>Per diems</td>
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C. Subcommittee Sessions Elsewhere

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<thead>
<tr>
<th></th>
<th>Yes</th>
<th>Yes</th>
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<tbody>
<tr>
<td>Transportation</td>
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<tr>
<td>Per diems</td>
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*If attending the associated Council meeting, Councilors can obtain up to $1434 of the cost of registering for and traveling to each ACS Spring and Fall Meeting by submitting their vouchers to their participating local sections or divisions. These funds come from the Councilor Travel Reimbursement Fund.

**Since service on SOCED necessitates early arrival at the ACS Spring and Fall Meetings (on Thursday), all members/associates/consultants will be entitled to claim two nights of hotel and three days of per diem (actual costs) with receipts up to a maximum not to exceed $1434 per meeting.

Note that participants in SOCED are provided with the following group meals: reception on Thursday and breakfast, lunch, and dinner on Friday.
TAB 1

To view the full ACS Strategic Plan, go to strategy.acs.org
ACS Strategic Plan
strategy.acs.org

Vision
Improving all people’s lives through the transforming power of chemistry

Mission
Advancing the broader chemistry enterprise and its practitioners for the benefit of Earth and all its people

Core Values
- Passion for Chemistry and the Global Chemistry Enterprise
- Focus on Members
- Professionalism, Safety, and Ethics
- Diversity, Equity, Inclusion, and Respect (DEIR)

Goals

Goal 1: Provide Information Solutions
Deliver indispensable chemistry-related information solutions to address global challenges and other issues facing the world’s scientific community.

Goal 2: Empower Members and Member Communities
Provide access to opportunities, resources, skills training, and networks to empower our global members and diverse member communities to thrive.

Goal 3: Support Excellence in Education
Foster the development of innovative, relevant, and effective chemistry and chemistry related education.

Goal 4: Communicate Chemistry’s Value
Communicate — to the public and to policymakers — the vital role of chemical professionals and chemistry in addressing the world’s challenges.

Goal 5: Embrace and Advance Inclusion in Chemistry
Promote diversity, equity, inclusion, and respect; identify and dismantle barriers to success; and create a welcoming and supportive environment so that all ACS members, employees, and volunteers can thrive.

American Chemical Society
As approved by the ACS Board of Directors, 12/13/2021
American Chemical Society’s Statement on Diversity, Equity, Inclusion & Respect
Approved by the ACS Board of Directors, August 2021

The American Chemical Society (ACS) is actively committed to cultivating a diverse, equitable, inclusive, and respectful community of chemistry professionals. Diversity, equity, inclusion and respect (DEIR) are among the core values of ACS. Embracing and advancing inclusion in chemistry is one of the goals in the ACS Strategic Plan.

We encourage inclusivity and oppose discrimination in scientific learning and practice based on—but not limited to—race, religion, country or ethnic origin, country of residence, citizenship, language, political opinion, sex, gender identity and expression, sexual orientation, disability, age, economic status and educational attainment. The Society believes that an enduring commitment to diversity enables excellence, innovation, and transformative action by current and future generations of chemistry professionals.

We reaffirm our commitment to an environment where all scientific work is conducted and communicated with integrity, fairness, and transparency at all organizational levels. The chemistry enterprise thrives when we, its practitioners, align all the aspects of our scientific endeavors - including professional interactions and engagement with other scientists, trainees, and the general public - with our core DEIR values and conduct policies. We will not tolerate behaviors that do not align with these values and policies.

To this end, ACS will implement the principles of DEIR within its leadership, employees and membership to build an inclusive community across the chemistry enterprise. We will quantify and monitor DEIR metrics; evaluate the impact of administrative and governance actions intended to enhance inclusion within ACS; and build sustainable processes for addressing inequities in the scientific community.

ACS is not alone in pursuit of these efforts. Supporting material may be found here from other global organizations:
1) International Science Council’s Statute 7
2) United Nations’ Sustainable Development, including the Sustainable Development Goals numbers 5: Gender Inequalities; 10: Reduced Inequalities; and 16: Peace, Justice, and Strong Institutions.
3) UN General Comment No. 25 (2020) on Science and Economic, Social and Cultural Rights
American Chemical Society
Volunteer/Meeting Attendee Conduct Policy

One of the key strengths of the ACS has been the enduring and varied contributions made by its thousands of dedicated volunteers.

Another unassailable strength of the ACS is its outstanding national meetings program. ACS national meetings are among the most respected scientific meetings in the world. ACS national meetings offer scientific professionals a legitimate platform to present, publish, discuss, and exhibit the most exciting research discoveries and technologies in chemistry and its related disciplines. Furthermore, ACS national meetings facilitate networking opportunities, career development and placement, and provide organizations with opportunities to exhibit products and services to targeted audiences.

The Society’s Congressional Charter explicitly lists among its objectives “the improvement of the qualifications and usefulness of chemists through high standards of professional ethics, education and attainments....” The ACS expects its volunteers and national meeting attendees to display the highest qualities of personal and professional integrity in all aspects of their ACS-related activities. Indeed, every chemical professional has obligations to the public, to volunteer and staff colleagues, and to science.

Accordingly, and to foster a positive environment built upon a foundation of trust, respect, open communications, and ethical behavior, the ACS Board of Directors has issued this Conduct Policy. It applies to ACS Volunteers, i.e., it applies to individuals conducting the business and affairs of the ACS without compensation for that conduct. It also applies to attendees at ACS national meetings. Volunteers and national meeting attendees should at all times abide by this Conduct Policy. Specifically:

1. Volunteers should understand and support ACS’s vision and mission.

2. Volunteers and national meeting attendees should contribute to a collegial, inclusive, positive, and respectful environment for their fellow volunteers and attendees, as well as for other stakeholders, including national meeting vendors and ACS staff.

3. Volunteers and national meeting attendees must avoid taking any inappropriate actions based on race, gender, age, religion, ethnicity, nationality, sexual orientation, gender expression, gender identity, marital status, political affiliation, presence of disabilities, or educational background. They should show consistent respect to colleagues, regardless of the level of their formal education and whether they are from industry, government or academia, or other scientific and engineering disciplines.

4. Volunteers and national meeting attendees should interact with others in a cooperative and respectful manner. Volunteers and national meeting attendees should refrain from using insulting, harassing, or otherwise offensive language in their ACS interactions. Disruptive, harassing, or inappropriate behavior toward other volunteers, stakeholders, or staff is unacceptable. Personal boundaries set by others must be observed. Harassment of any kind, including but not limited to unwelcome sexual advances, requests for sexual favors, and other verbal or physical harassment will not be tolerated.

5. Volunteers must obey all applicable laws and regulations of the relevant government authorities while acting on behalf of the ACS. Likewise, national meeting attendees must obey all applicable laws and regulations of the relevant government authorities while attending ACS national meetings. Volunteers and national meeting attendees alike should also ensure that they comply with all applicable safety guidelines relating to public chemistry demonstrations.

6. Volunteers and national meeting attendees should only use ACS’s trademarks, insignia, name, logos, and other intellectual property in compliance with ACS regulations and directives as may be issued from time to time.

7. Violations of this Conduct Policy should be reported promptly to the ACS Secretary and General Counsel or to the Chair of the ACS Board of Directors. In cases of alleged persistent and/or serious violations of this Conduct Policy, the Board shall review the evidence and shall take such actions as may be appropriate, including but not limited to requiring volunteers to leave their volunteer position(s); precluding volunteers from serving in Society volunteer roles in the future; requiring national meeting attendees to leave the meeting; and, precluding meeting attendees from attending future ACS national meetings. ACS, through its Board of Directors, reserves the right to pursue additional measures as it may determine are appropriate.

Adopted by the Board of Directors 12/6/13
TAB 2
Society Committee on Education
2019-2021 Strategic Plan
Approved 2018, Revised July 2020

Vision
The future of chemistry teaching and learning

Mission
Develop and implement policies and resources to advance chemistry education and to connect its diverse communities

Goal 1: Promote effective chemistry education
- Strategy 1 (revised): Contribute to a joint white paper on supportive educational environments for all graduate students and postdoctoral scholars.
- Strategy 3: Host a symposium, round table, or workshop to highlight the use of evidence-based instructional practices (EBIPs) by the Biennial Conference on Chemical Education 2020.
- Strategy 4: Identify and determine the strategies for how to disseminate effective chemistry education by Q4 2020.

Goal 2: Foster collaborative and sustainable environments for emerging and existing communities in chemistry education.
- Strategy 1: By Q4 2019, identify existing chemistry education communities, gaps in these communities and their needs and share with Goal 1 teams to help promote effective chemistry education.
- Strategy 2: Collaborate with ACS Education staff to develop a strategy for forming graduate student organizations by the end of 2019.
- Strategy 3: Work with the International Activities Committee to build a strategy to develop relevant student chapter programs, products, and services by the end of 2019.
- Strategy 4: Work with the Diversity and Inclusion Advisory board on issues related to equity in chemistry education by 2020.

Goal 3: Identify opportunities and approaches for communication and collaboration among education stakeholders.
- Strategy 1: Develop a robust and responsive liaison process.
- Strategy 2: Map out all current education initiatives, resources, and programs across ACS to inform articulation of SOCED roles and responsibilities by summer 2019.
- Strategy 3: Identify opportunities and approaches for collaboration among education stakeholders.
- Strategy 4: Determine possible structure of SOCED that aligns with roles and responsibilities by 2020.
ACS SOCIETY COMMITTEE ON EDUCATION (SOCED)

ACS Goal 3: Support Excellence in Education

Foster the development of innovative, relevant, and effective chemistry and chemistry related education.

ACS will support reforms and initiatives that result in highly effective chemistry education, safer laboratory practices, and the preparation of technically competent, ethical, and competitive chemists ready to address global challenges. Through formal and informal educational resources, instruction, and mentorship, ACS and its members will encourage the incorporation of principles of safety and ethics throughout pre-college, undergraduate, graduate, and post-graduate education. The Society will promote the development and dissemination of evidence-based practices in chemistry education and professional development to foster a scientifically literate citizenry and ensure a highly qualified chemical workforce.

SOCED Vision, Mission, and Goals (2019-2021)

Vision: The future of chemistry teaching and learning

Mission: Develop and implement policies and resources to advance chemistry education and to connect its diverse communities

Goal 1: Promote effective chemistry education

Goal 2: Foster collaborative and sustainable environments for emerging and existing communities in chemistry education

Goal 3: Identify opportunities and approaches for communication and collaboration among education stakeholders

SOCED Charge per the ACS Governing Documents

1. Implement SOCIETY policies in chemical education;
2. Develop reports and recommendations to the Board and the Council on SOCIETY policies related to chemical education and SOCIETY programs for the improvement of chemical education;
3. Receive, review, and make recommendations to the Board and the Council on proposals for policies and programs in chemical education;
4. Act in an advisory capacity on matters relating to chemical education;
5. Recommend approval or disapproval of requests for the funding of new or unbudgeted items related to chemical education;
6. Establish all regulations for Student Chapters, such as criteria and procedures for formation, membership criteria, program activity standards, criteria for dissolution and reinstatement, and all other rights and privileges, with the approval of the Committee on Constitution and Bylaws; and
7. Act for the Council in chartering and dechartering Student Chapters.
SOCED Committee Structure (effective January 1, 2021)

**Executive Committee Composition and Responsibilities** (Approved 2021-06-14)

Chair, Vice-Chair and Subcommittee Chairs

Provides strategic direction and guidance for the committee’s operations. Meets 4-6 times a year to plan for SOCED meetings; manage interim actions; and, to ensure the effective operations of the Committee. Staff liaisons to SOCED attend all Executive Committee meetings. The chair of SOCED typically serves for three years unless the individual’s term ends prior to the end of three years. Similarly, subcommittee chairs are appointed annually for up to three years unless their term on the committee expires within the three year period. Forms and dissolves subgroups as needed.

**Full Committee Composition and Responsibilities** (Approved 2021-06-14)

Members (12-20), Associates, and Consultants (1-2, based on need)

**SOCED’s General Responsibilities (in alignment with the SOCED charge)**

1. Ensure the Society’s core values are reflected in SOCED and ACS Education activities.
2. Advise ACS Education on its Operational Plan which primarily supports Goal 3 of the American Chemical Society’s strategic plan.
3. Advise on programs, products and services that can aid in creating a diverse, equitable, inclusive and respectful environment within the chemical education ecosystem.
4. Provide strategic guidance for its subcommittees and acting on recommendations from the subcommittees.
5. Advise the Society and ACS Education on trends and where there are gaps in programming, products or services.
6. Respond to reports/requests from groups (not oversight): i.e., ChemClub Advisory Board; Hach Advisory Board; AACT Governing Board; Textbook Writing Teams; and, others as warranted.
7. Recommend and/or support new programs for funding.
Subcommittees

SUPPORTING EXCELLENCE IN EDUCATION SUBCOMMITTEE
Approved 2021-06-14; revised 2021-12-07

Chaired by a member or associate of SOCED. Comprised of members, associates and consultants of SOCED. When feasible, the consultant from the Division of Chemical Education will serve on this subcommittee. Chairs of the subgroups associated with this subcommittee will also serve as members and serve as the representative for their subgroup.

- Advises ACS Education on opportunities and challenges related to the education ecosystem.
- Ensures the Society’s core values are reflected in the design and implementation of ACS Education programs, products, and services.
- Organizes and facilitates workshops at ACS-sponsored meetings and other professional learning opportunities, based on the needs of the community, that reflect practices informed by education research and evidence.
- Recommends and fosters collaborative efforts with internal and external education stakeholders.
- Oversees the appointment process to build diverse and inclusive subgroups that connect stakeholders with unique perspectives and expertise.

Learning and Teaching: K-12 Subgroup
Chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The chair of the Supporting Excellence in Education subcommittee and the chair of SOCED must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

- Provides feedback to ACS K–12 staff on ACS Education programs, products, and services.
- Serves as a voice for the K–12 community by discussing and providing guidance on K–12 chemistry education topics based on trends, research and effective practices.
- Supports and assists with the review and revision of the Guidelines and Recommendations for Teaching Middle and High School Chemistry.
- Selects finalists for two ChemLuminary Awards: “Outstanding High School Student Program Award” and “Outstanding Kids & Chemistry Award”.
- Works closely with the American Association of Chemistry Teachers to advance K–12 education
- On behalf of SOCED, receives/reviews reports from the ACS-Hach Advisory Board; ChemMatters Policy Board, the AACT Governing Board, and other groups who advance K–12 education.

Learning and Teaching: Higher Education Subgroup
Chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The chair of the Supporting Excellence in Education subcommittee and the chair of SOCED must approve of the subgroup’s appointments. Subgroup members serve a three-year term.
• Serves as a voice for the Higher Education community by discussing and providing guidance on undergraduate and graduate chemistry education topics based on trends, research, and effective practices.
• Supports and assists with the review and revision of the Guidelines for Chemistry in Two-Year College Programs.
• Provides strategic guidance to staff who focus on higher education programs, products and services.
• Advises and supports the formation of strategic partnerships that will promote excellence in education within the higher education community.
• Collaborates with the Committee on Professional Training, USAB, and GSPSAB as appropriate to support excellence in education.

STUDENT COMMUNITIES SUBCOMMITTEE
Approved 2021-06-14

Chaired by a member or associate of SOCED. Comprised of members, associates and consultants of SOCED. Chairs of the subgroups associated with this subcommittee will also serve as members and serve as the representative for their subgroup. A member of the subcommittee serves as the SOCED liaison to the Committee on Membership Affairs and the International Activities Committee and other committees as needed to ensure that the best interest of students are considered in membership-related decisions and actions.

• Provides strategic guidance for programs, products and services for undergraduate and graduate students, as well as postdoctoral scholars, [working with the Undergraduate Student Advisory Board, Graduate Student and Postdoctoral Scholar Advisory Board, U.S. National Chemistry Olympiad subgroup, and other subgroups] to ensure that these communities see value in being a member of ACS and are connected with ACS component groups (i.e., local sections and technical divisions) to help build a membership continuum. Provides recommendations to SOCED relative to this area, as appropriate.
• Ensures the Society’s core values are reflected in the design and implementation of ACS Education programs, products, and services for student communities.
• Oversees the student-based ChemLuminary process.
• Oversees the appointment process to build diverse and inclusive subgroups that connect stakeholders with unique perspectives and expertise while ensuring that the subgroups provide reports of their activities on a regular basis.
• Ensures that ACS student programming is relevant, valuable and provides the opportunity for scientific and critical skills building, as well as building networks.
• Receives reports (oral or written), as needed, from groups such as the ChemClubs Advisory Board, and other groups who have a connection to student communities.

Undergraduate Student Advisory Board (USAB)
Chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The subgroup may also invite students to join USAB as needed. The chair of the Student Communities Subcommittee and the chair of SOCED must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.
• Serves in a consultative role to SOCED on matters related to student chapters and student members.
• Oversees the student chapter report and awards process.
• Provides guidance for undergraduate student chapters globally.
• Provides strategic input for the successful development and execution of programs, products and services that supports the professional growth of and community building of undergraduate students working with staff from the Student Communities Office and the Student and Postdoctoral Scholars Office.
  o Including undergraduate student programming for ACS meetings working with staff from the Student Communities Office and the Student and Postdoctoral Scholars Office while ensuring that collaborative efforts are planned with GSPSAB.

Graduate Student and Postdoctoral Scholars Advisory Board (GSPSAB)
Chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The subgroup may also invite students and postdoctoral scholars to join GSPSAB as needed. The chair of the Student Communities Subcommittee and the chairs of SOCED and the Committee on Professional Training must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

• Provides strategic input for the successful development and execution of programs, products and services for graduate students and postdoctoral scholars
  o Including graduate student and postdoctoral scholar programming for ACS meetings working with staff from the Student Communities Office and the Student and Postdoctoral Scholars Office while ensuring that collaborative efforts are planned with USAB.
• Advises on the development of graduate student and postdoctoral scholar programming for ACS meetings working with staff from the Student Communities Office and the Student and Postdoctoral Scholars Office while ensuring that collaborative efforts are planned with USAB.
• Monitors and advises on effective practices in graduate student and postdoctoral scholar training.
• Provides guidance for the establishment and growth of Graduate Student Organizations.

U.S. National Chemistry Olympiad Subgroup
Chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. Four Task Forces assist this subcommittee with its work: Olympiad Exams Task Force; Olympiad Laboratory Practical Task Force; Mentor Selection Task Force; and the Exam Grading Task Force. The chair of the Student Subcommittee and the chair of SOCED must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

• Sets goals for the U.S. National Chemistry Olympiad competition, establishing rules and guidelines for the program and implementing recommendations and procedures to maintain the operation of the program.
• Reviews the exam (local and national) questions.
• Reviews and selects finalists for the USNCO ChemLuminary award.
• Advises on effective practices for increasing the awareness of the program.
SCIENCE EDUCATION POLICY SUBCOMMITTEE
Approved 2021-06-14

Chaired by a member or associate of SOCED. Comprised of members, associates and consultants of SOCED. Chairs of the subgroups associated with this subcommittee will also serve as members and serve as the representative for their subgroup. A member(s) of this subcommittee will serve as science policy writing team leads or contributors, on behalf of SOCED, as requested by the Committee on Public Affairs and Public Relations.

- Recommends public policy statement updates to SOCED in preparation for recommending to the ACS Board of Directors every third year on issues including science education, federal funding for scientific research and education, and visas (related to education and scientific exchange).
- Identifies policy needs through research and collaboration both internally and, when appropriate, with external partners to ensure that SOCED is able to lead the conversation on improvements to and investments in our nation’s education systems.
- Communicates the value of a member driven public policy statement process and its role in the Society’s advocacy for the chemistry enterprise, through webinars, workshops, and other tools. Supports ACS public policy priorities by developing advocacy awareness through participating in advocacy workshops and messaging campaigns in collaboration with the ACS Office of External Affairs and the Committee on Public Affairs and Public Relations.
- Ensures the Society’s core values are reflected in the development, management, and implementation of ACS science education policies.
- Oversees the appointment process to build diverse and inclusive subgroups that connect stakeholders with unique perspectives and expertise while ensuring that the subgroups provide reports of their activities on a regular basis.
TAB 3
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SOCED 2022 Subcommittee Assignments

Supporting Excellence in Education
Tracy Halmi, chair
Terri Chambers, staff liaison

- Roxie Allen (A)
- Sandra Bonnetti (F)
- Russ Carley (A)
- Kevin Gable (A)
- Daniel King (F)
- Tyler Kinner (A)
- Amy Nicely (A)
- Sam Pazicni (F)
- Missy Postlewaite (A)
- Armando Rivera-Figueroa (A)
- Ellen Yezierski (F)

Science Education Policy
Laura Pence, chair
Lauren Posey, staff liaison

- Jesse Bernstein (F)
- Brent Eldridge (A)
- Cheryl Frech (A)
- Pamela Leggett Robinson (A)
- Stacey Lowry-Bretz (A)
- MaryKay Orgill (F)
- Teri Quinn-Gray (A)
- Danaé Quirk (F)
- Steven Trohalaki (A)

Student Communities
Matt Mio, chair
Nancy Bakowski, staff liaison

- Michael Adams (F)
- Michelle Boucher (F)
- Milly Delgado (F)
- Dana Emmert (A)
- Meledath Govindan (F)
- Margaret Kanipes-Spinks (F)
- Pam Kerrigan (F)
- Judy Kim (F)
- Irv Levy (A)
- Sergey Nizkorodov (A)
- Joshua Pak (F)
- Kristine Smetana (F)

Key:  Full Member (F)  |  Associate Member (A)  |  Consultant (C)
TAB 4
The Society Committee on Education (SOCED) held its executive session via Zoom on August 10, 2021, beginning at 2:30 p.m. EDT. The following were present for all or part of the executive session:

**Members:** Carmen Gauthier (Chair), Tracy Halmi (Subcommittee Chair), Matt Mio (Subcommittee Chair), Michael Adams (Vice-Chair), Jesse Bernstein, Sandra Bonetti, Milagros Delgado, Jeremy Garritano, Meledath Govindan, Joshua Pak, Samuel Pazicni, Sarah Preston, Dana’e Quirk Dorr, Susan Shih (Pamela Kerrigan, Kristine Smetana, and Ellen Yezierski were unable to attend)

**Associates:** Laura Pence (Subcommittee Chair), Roxie Allen, Michelle Boucher, Dorian Canelas, Cheryl Frech, Kevin Gable, Judy Kim, Daniel King, Pamela Leggett-Robinson, Amy Nicely, MaryKay Orgill, and Missy Postlewaite (Teri Quinn Gray, Margaret Kanipes-Spinks, Tyler Kinner, and Irvin Levy were unable to attend)

**Consultants:** Dawn Del Carlo, Jennifer Nielson

**Liaisons:** Rodney Bennett (CONC), Bryan Boudouris (Project SEED Chair), Kerry Karukstis (CPT Chair), Anna Wilson (SCC)

**Staff:** LaTrease Garrison (Staff Liaison), Jodi Wesemann (Associate Staff Liaison), Nancy Bakowski, Terri Chambers, Nicole Di Fabio, Ashley Donovan, Lis Gallegos, Racquel Jemison, Kelley Love, Rajendrani Mukhopadhyay, Joan Ogburn-Hyson, Lauren Posey, Lily Raines, and Joerg Schlatterer

**Summary of Action Items:**

**Action Item 21-12:** Visit and provide feedback on chemical education posters in the CHED Undergraduate Research Poster Session – Michelle Boucher, Mel Govindan, Daniel King, Tyler Kinner, Irv Levy, Matt Mio, Amy Nicely

**Action Item 21-13:** Submit reimbursements for ACS Fall 2021 meeting registration to Joan by September 9 – those visiting and providing feedback on posters

**Action Item 12-14:** Submit feedback regarding the change driver presentation (**SOCED Agenda Book**, Tab 7) and resources, completing the **Strategic Planning Committee survey** by September 15 – all

**Action Item 12-15:** Consider change drivers while developing future SOCED plans – Executive Committee

**Action Item 12-16:** Contact Laura Pence (**LPence@hartford.edu**) or Lauren Posey (**l_posey@acs.org**) if interested in joining the discussions of the DEIR or Emerging Trends working groups of the Science Education Policy subcommittee – all

**Welcome**

SOCED Chair Carmen Gauthier welcomed and thanked participants for taking time to meet virtually. After introductions, Gauthier highlighted the new ACS Goal 5 to embrace and advance inclusion in chemistry, and Matt Mio facilitated a diversity, equity, inclusion and respect moment focused on accent unconscious bias.
The Fall 2021 SOCED schedule was reviewed, as well as the ACS Fall 2021 registration reimbursement policy, and the SOCED voting procedures.

**Approval of Minutes**

1. SOCED voted to approve the minutes from the SOCED Spring 2021 meeting.

**Chair’s Report**

Gauthier referenced the ACS Education highlights and acknowledged the ongoing support of the chemistry community during the COVID-19 pandemic.

The informational items in the Chair’s report were highlighted: the Lasting Encounters between Aspiring and Distinguished Scientists (LEADS) Conference, the ACS Bridge Project, Get the Facts Out, and Impact Indicators and Instruments for Individual Development Plans (I3IDP).

Gauthier noted that she and Vice-Chair Mike Adams continue to hold conference calls with the chair and vice-chair of the Committee on Professional Training to ensure that both committees collaborate effectively without overtaxing volunteers or duplicating efforts on the many education initiatives that are underway. Tentative plans are being made for a Spring 2022 joint luncheon and joint reception at ACS Fall 2022. Committee input on potential topics for the Spring 2022 joint luncheon was solicited.

MaryKay Orgill provided updates on plans to prepare the SOCED nomination for ACS Fellows. In September/October, she will be convening the working group, consisting of Jesse Bernstein, Michelle Boucher, Tyler Kinner, and Irv Levy.

Plans for student programming at the ACS Fall 2021 meeting were reviewed.

**Action Item 21-12:** Visit and provide feedback on chemical education posters in the CHED Undergraduate Research Poster Session – Michelle Boucher, Mel Govindaan, Daniel King, Tyler Kinner, Irv Levy, Matt Mio, Amy Nicely

Committee members were encouraged to attend the Undergraduate Research Poster Session and other virtual, hybrid, and in-person events associated with the ACS Fall 2021 meeting.

**Action Item 21-13:** Submit reimbursements for virtual meeting registration to Joan by September 9 – those visiting and providing feedback on posters

**Liaison Reports**

**Committee on Professional Training**

Kerry Karukstis, CPT Chair, reported that CPT has continued to conduct its work via virtual meetings, conferences, and site visits. In addition to reviewing programs, CPT is revising the ACS Guidelines for Bachelor’s Degree Programs in Chemistry. The revised guidelines are expected to be published in 2022. A restructuring of the guidelines format will aim to encourage programs to continually enhance their curriculum. Additional modifications focus on the development of
professional skills and competencies; promotion of a comprehensive view of safety; and recommendations for advancing diversity, equity, inclusion, and respect (DEIR) policies and educational practices in academic settings. SOCED members provided references regarding skill development and suggestions for promoting the value of ACS Approval.

CPT is also building on the 2020 pilot on global use of ACS guidelines, as well as providing guidance and support to programs during the time of COVID-19.

**Committee on Project SEED**
Bryan Boudouris, Committee on Project SEED Chair, shared highlights regarding the selection of Project SEED and CIBA scholarships and implementation of the committee’s strategic plan. He reported on the 2021 Virtual Summer Camp and the Virtual Research Pilot, noting the opportunity to use technology to increase geographical diversity. Concurrent use of in-person and virtual research experiences is being considered for the future, as well as a virtual summer camp.

**American Association of Chemistry Teachers**
Pamela Leggett-Robinson, SOCED liaison to the AACT Board, reported that 2021-2022 AACT president Greta Glugoski-Sharp will be seeking to advance the teaching of chemistry in a culturally responsive manner.

**Senior Chemists Committee**
Anna Wilson, liaison from the SCC, highlighted the virtual networking and ice cream social being held during ACS Fall 2021. She also reported on plans to bring chemistry to 4th grade students in conjunction with National Chemistry Week. Plans for an upcoming ACS webinar co-produced with SCC were announced.

**ACS Institute**
Terri Chambers, Sr. Director, Education, provided an overview of the new ACS Institute, launched in May. The vision is to develop a comprehensive and authoritative learning portal that supports the professional development and growth of chemists as highly effective professionals. The courses and learning assets are mapped to competencies, as well as organized into ACS Centers. Next steps and the decision tree for considering additional content were shared.

**ACS Office of Diversity, Equity, Inclusion & Respect**
Rajendrani (Raj) Mukhopadhyay introduced the new ACS Office of DEIR, which is serving as a central hub for DEIR work across ACS focused on fulfilling ACS Goal 5 to embrace and advance inclusion in chemistry.

The ACS Office of DEIR will be validating a list of future characteristics developed during a three-part DEIR Advisory Board workshop series held with ACS volunteers and staff:
- An environment where all have a sense of belonging across every level of the Society
- Leaders of all levels are prepared, ready, and accountable for displaying DEIR
Rewards and recognitions are reflective of inclusivity and the involvement of new members.

Communication is transparent, accessible, and consistent to promote awareness of resources, policies, and opportunities throughout the Society. A robust communication plan will also be developed to ensure that all members and stakeholders are aware, engaged, and involved.

Initial steps for changing cultures and mindsets include DEIR moments, such as those SOCED is having, and encouraging two-way dialogue. The importance of taking meaningful steps to uphold the ACS core value of DEIR and demonstrate progress on Goal 5 were discussed.

**Committee on Committees Report**

ConC Liaison Rodney Bennett provided a brief update on ConC activities. In addition to streamlining committee structures, processes, and terms, ConC is continuing to take actions to advance DEIR, bringing in more associate members. A committee census is being conducted to better understand the skill sets needed for committees to fulfill their charges. ConC is also updating the preference forms. Bennett encouraged SOCED to work with other committees.

**ACS Change Drivers**

Martin Rudd, Vice-Chair of the Council Policy Committee and member of ACS Board Committee on Strategic Planning, reviewed the recently updated change drivers and framework for their use. The change drivers are taking an external view, looking ahead 3-5 years. SOCED was encouraged to consider important changes related to its work that are or could be happening.

**Action Item 12-14:** Submit feedback regarding the change driver presentation ([SOCED Agenda Book](https://example.com), Tab 7) and resources, completing the [Strategic Planning Committee survey](https://example.com) by September 15 – all

**Action Item 12-15:** Consider change drivers while developing future SOCED plans – Executive Committee

**SOCED Restructuring**

Gauthier reviewed the new structure and announced that the Executive Committee approved the subcommittee recommendation to rename the Promoting Excellence in Education Subcommittee to the Supporting Excellence in Education Subcommittee. Subgroups for the Supporting Excellence in Education Subcommittee and for the Science Education Policy Subcommittee have been formed, joining those already in place for the Student Communities Subcommittee.

**SOCED Strategic Plan**

Adams thanked Gauthier for her work while SOCED Vice-Chair and congratulated the committee for the progress made on implementing the strategic plan in the midst of a pandemic. He reviewed the vision, mission, goals, and strategies. The strategies remaining to be fulfilled have been mapped to the appropriate subcommittees to consider appropriate next steps.
**Subcommittee Reports**

**Supporting Excellence in Education Subcommittee**

Tracy Halmi, subcommittee chair, introduced the members of the Supporting Excellence in Education Subcommittee, as well as the goals of the subgroups. Topics of discussion include teaching evaluations, the role of publishers, open access course materials, visibility and use of chemistry education research, and ensuring that DEIR are reflected in subcommittee activities.

The subcommittee and subgroups have been considering how SOCED might strengthen the many efforts underway and foster collaboration across the chemistry education community. Having subgroup members from outside of SOCED has been very valuable. The importance of respecting the roles of various stakeholder groups and the challenges associated with coordinating efforts were noted.

**Student Communities Subcommittee**

Mio, subcommittee chair, introduced the members of the Student Communities Subcommittee, reviewed charges for the subcommittee and subgroups. He highlighted the importance of clarifying that the subcommittee is focused on a wide range of communities, not just student chapters. The subcommittee and its subgroups fulfill a range of programming and consultative responsibilities.

Subcommittee discussions are focusing on DEIR and facilitating communications among subgroups. Mio noted the value of scheduling subgroup and subcommittee meetings in sequence.

**Science Education Policy Subcommittee**

Laura Pence, subcommittee chair, introduced the members of the Science Education Policy Subcommittee and how its three key areas of work expand on the work of policy writing teams: policy statement management, develop/identify policy need, messaging and advocacy.

Three working groups have been established to inform the revisions to the Science Education Policy statement. One is focused on incorporating key points from the Hands-on Science and Teaching of Evolution statements. Another is ensuring that DEIR language is emphasized. A third is considering emerging trends and technologies.

*Action Item 12-16*: Contact Laura Pence ([LPence@hartford.edu](mailto:LPence@hartford.edu)) or Lauren Posey ([l_posey@acs.org](mailto:l_posey@acs.org)) if interested in joining the discussions of the DEIR or Emerging Trends working groups of the Science Education Policy subcommittee – all

Pence noted the need for the evolution of Science Education Policy statement and the extended timeline, which allows for input from other groups. She thanked those who organized and attended the science policy webinar.

Gauthier thanked the subcommittees for their thoughtful consideration and implementation of the new charges.
**New Business**
SOCED passed a resolution recognizing Susan Shih, who was completing her final term of service on the committee.

Gauthier reminded the committee of the student programming being held at the ACS Fall 2021 meeting and associated action items. She also announced that the SOCED ChemLuminary awards, as well as those given jointly with the International Activities Committee and the AACT Governing Board, will be given at the ChemLuminary Awards Ceremony, which will be held virtually in conjunction with National Chemistry week.

The SOCED Executive Session adjourned at 5:20 p.m. EDT.
Welcome and Safety/DEIR Moment
Chair Carmen Gauthier welcomed everyone. A combined safety and DEIR focused on a thoughtful example of how DEIR efforts can be integrated into chemical education activities. See: Kimble-Hill, A. Incorporating Identity Safety in the Laboratory Safety Culture, ACS Chemical Health & Safety, 2021, 28, 103-111

Update on Goal 3 Portfolios and the Portfolio Evaluation and OPtimization (PEVOP) activities
Gauthier provided a brief overview of the three Goal 3 portfolios being developed as part of the new Portfolio Evaluation and OPtimization (PEVOP) process:
1. Advancing Lifelong Learning
2. Building Chemistry Education Capacity
3. Strengthening Goal 3 Infrastructure and Support
The Executive Committee was thanked for the input provided at the September meeting, which informed LaTrease Garrison’s discussions with the PEVOP Subcommittee of the Committee on Budget & Finance. More formal feedback is coming, but the initial feedback from PEVOP was positive. Garrison noted that the PEVOP Subcommittee had compiled questions and suggestions regarding programmatic aspects, putting them in “parking lot” as they conducted a broader review.

Items for Executive Committee action
Approval of ACS Fellows nomination process
The Executive Committee considered the ACS Fellows nomination process from MaryKay Orgill and the task force she is leading. The focus on SOCED and former SOCED members and plans to provide a list of names were appreciated.

The SOCED Executive Committee voted to approve the revised ACS Fellows nomination process, as proposed by the task force, with the minor edit that it refer to positions (e.g. chair) rather than names (e.g. Gauthier).

Approval of plans for Graduate Student Awards
The Executive Committee considered the approval of the plans for Graduate Student Awards from the Graduate Student and Postdoctoral Scholars Advisory Board (GSPSAB).
The SOCED Executive Committee voted to approve the plans for Graduate Student Awards, as proposed by GSPSAB, with the requests that:

- it be clearly presented as a recognition program, avoiding confusion with ACS National Awards
- efforts to synchronize with other recognition efforts, such as AACT, and avoid duplication
- a self-assessment/status report be made on the pilot back to SOCED Student subcommittee for Fall 2022 meeting

**Clarification of programming roles for SOCED**

The Executive Committee discussed the SOCED role in programming, in response to questions from the Teaching and Learning: Higher Ed subgroup chair, considering the primary responsibility that ACS technical divisions have for programming at ACS Spring and Fall meetings, committees co-sponsorship of programming (as SOCED does with the Undergraduate Research Poster Sessions), and opportunities for committees to complement what the technical divisions program (as SOCED does with the student programming and occasional workshops/symposia).

During the recent restructuring, there has been an assumption that such co-sponsorship and programming will continue. The charge for the Supporting Excellence in Education Subcommittee includes:

- Organizes and facilitates programming at ACS-sponsored meetings that reflect practices informed by education research and evidence.

The charges for the student advisory boards also include providing strategic input/advice on the development of student and postdoctoral scholar programming for ACS meetings working with staff from the Student Communities Office and the Student and Postdoctoral Scholars Office while ensuring that collaborative efforts are planned across USAB and GSPSAB.

The importance of collaborating and avoiding duplication of effort, as well as the opportunity for more professional development, were noted. A potential change to the Supporting Excellence in Education Subcommittee charge was suggested:

- Organizes and facilitates professional development activities that reflect effective practices in chemical education.

**Action item:** Consider potential changes/clarifications to the charge for the Supporting Excellence in Education Subcommittee – Tracy Halmi

To help ensure that SOCED’s programming activities do not overstep or conflict with those of CHED or other technical divisions or committees, Gauther asked the Executive Committee to:

1) Remind SOCED leaders of the Vision, mission and goals of the current SOCED strategic plan and how they reflect the importance of communicating and collaborating.
2) Revisit the overall general responsibilities of SOCED, which do not include programming, highlighting that any programming must support these responsibilities.
3) Highlight the programming responsibilities of ACS technical Divisions and opportunities for partnering.

**2022 Plans**

**Appointment recommendations**
Gauthier reported that CONC is considering SOCED input and the need for succession planning as it implements the new reduced periods of service on committees. The CONC recommendations for 2022 appointments and reappointments will be considered by the 2022 ACS President and Chair of the Board in December, after which appointments will be communicated.

**Subcommittee assignments**
Assignments to subcommittees will be expedited once the SOCED appointments are made and accepted, in order to prepare for February meetings.

*Action item:* Consider what expertise and skill sets are needed on for each subcommittee – SOCED Executive Committee

**SOCED spring 2022 meeting**
The Executive Committee considered potential meeting formats for spring 2022, proposing that the full committee meet in person in San Diego and that subcommittees and subgroups meet virtually in February. The option of holding subcommittee meetings after the Executive Session was discussed, noting that any motions or reports would need to be addressed at the next Executive Session or by the Executive Committee in the interim. USAB and GSPSAB may still meet in person depending on their business needs.

*Action item:* Poll SOCED members about plans to travel to San Diego for SOCED meetings in spring 2022 – LaTrease/Joan

Plans will be finalized based on the poll results and the guidance that CONC will be providing regarding governance meetings for spring 2022.

The Executive Committee discussed the potential topics for 2022 CPT/SOCED luncheon discussion. The option of building on the Department Chairs discussion of general chemistry and DEIR was considered as a way to help position chemistry to be more welcoming to diverse students (the topic SOCED preferred). Although the format still remains to be determined, planning should proceed, framing the discussion so that there are outcomes and action items for each and both committees.

*Action item:* Discuss 2022 CPT/SOCED lunch discussion plans with the CPT chair and vice-chair – Gauthier and Adams
Recap action items and adjourn
Gauthier noted that approaches to future SOCED strategic planning and appointments to US National Chemistry Olympiad taskforces will be discussed at the December Executive Committee meeting.

Action items:
- Consider potential changes/clarifications to the charge for the Supporting Excellence in Education Subcommittee – Tracy Halmi
- Consider what expertise and skill sets are needed on for each subcommittee – SOCED Executive Committee
- Poll SOCED members about plans to travel to San Diego for SOCED meetings in spring 2022 – LaTrease/Joan
- Discuss 2022 CPT/SOCED lunch discussion plans with the CPT chair and vice-chair – Gauthier and Adams

Gauthier thanked everyone for a productive meeting. The meeting adjourned at 3:28 pm EDT.
Welcome and Safety/DEIR Moment
Chair Carmen Gauthier welcomed everyone. A combined safety and DEIR focused on an example of how students can play in making department climates more safe and inclusive.


Items for Executive Committee action
Term limits for USNCO task forces
The Executive Committee considered the questions and concerns regarding the extension of three-year term limits for subgroups to USNCO task forces. It shared the concern about limited turnover and concurred with the need to actively recruit people, noting the importance of increasing the diversity of those involved in all aspects of USNCO, including those generating exam items.

Action item: Confer with CONC liaison, getting guidance on how to apply the petition to governance task forces - Garrison

Action Item: Discuss next steps with the Chair of the USNCO subgroup – Mio and Gauthier

Clarification of programming roles for SOCED
The Executive Committee returned to its discussion of the SOCED role in programming, first considered at its November meeting. During that meeting, the Executive Committee affirmed that SOCED activities should respect the roles that other committees and the technical divisions play in providing programming, and be pursued collaboratively if appropriate.

Tracy Halmi, Chair of the Supporting Excellence in Education (SEE) Subcommittee reported on the meeting that she and Terri Chambers, the subcommittee staff liaison, had with the SEE subgroup chairs and staff liaisons, sharing the recommended changes to items in the SEE charge and subgroups standing goals.
SEE Charge

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organizes and facilitates programming at ACS-sponsored meetings that reflect practices informed by education research and evidence.</td>
<td>Organizes and facilitates workshops at ACS-sponsored meetings and other professional learning opportunities, based on the needs of the community, that reflect practices informed by education research and evidence.</td>
</tr>
</tbody>
</table>

SEE K-12 Subgroup Standing Goals

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convene task forces charged with organizing and facilitating yearly symposia and/or workshops at ACS National meetings, ACS regional meetings, and Biennial Conferences.</td>
<td>Assesses the needs for professional development in K-12 and recommends to the SEE subcommittee topics and venues for workshops and other professional learning opportunities.</td>
</tr>
</tbody>
</table>

Higher Education Subgroup Standing Goals

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed Change</th>
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</thead>
<tbody>
<tr>
<td>Convene task forces charged with organizing and facilitating yearly symposia and/or workshops at ACS National meetings, ACS regional meetings, and Biennial Conferences.</td>
<td>Assesses the needs for professional development in higher education and recommends to the SEE subcommittee topics and venues for workshops and other professional learning opportunities.</td>
</tr>
</tbody>
</table>

1. The SOCED Executive Committee voted to approve the changes to the items in the SEE charge and subgroup standing goals related to programming.

Gauthier thanked all involved for considering how to respect the roles that other committees and the technical divisions play in providing programming and, if appropriate, pursue professional develop activities collaboratively.

2022 Plans
Timing of committee and subcommittee assignments
Gauthier noted that the 2022 committee assignments will be made later in December, after the 2022 ACS President and Chair of the Board consider the CONC recommendations, and then communicated to those appointed or reappointed. In January, when the SOCED new appointments and reappointments are confirmed, SOCED will turn to the subcommittee assignments, getting rosters in place for the subcommittee meetings to be held in February.

SOCED spring 2022 meeting
The Executive Committee returned to the SOCED spring 2022 meeting plans. Given that 19 of the current SOCED members indicated that they plan to be in San Diego, plans for a hybrid SOCED Executive Session are being made. Subcommittees are also planning hybrid meetings to follow
the Executive Session. There are preliminary plans for the Undergraduate Student Advisory Board and the Graduate Student and Postdoctoral Scholars Advisory Board to meet in San Diego as well, supporting the in-person student programming. Other subgroups and the subcommittees will meet virtually prior to ACS 2022 Spring. Options for Thursday evening reception and the joint lunch discussion with CPT were discussed.

**Action Item:** Send survey to members about Thursday evening reception - Garrison

**Potential approaches for future SOCED strategic planning**
The Executive Committee considered approaches to future SOCED strategic planning. Given how the COVID-19 pandemic delayed work and the time needed for the SOCED restructuring, SOCED will extend its work on the 2019-2021 plan into 2022. Starting in Q2 2022, SOCED will develop plans aligned with the new committee structure. These plans will inform and be informed by the ACS Goal 3 portfolios.

**Recap action items and adjourn**
Gauthier reviewed what SOCED will need to do in early 2022.

**Action items:**
Consider what expertise and skill sets are needed on subcommittees – Halmi, Mio, Pence
Conferring with subgroup chairs about subgroup appointments – Halmi, Mio, Pence
Get reports from subgroups, as appropriate – Halmi, Mio, Pence
Schedule subcommittee meetings for February – Halmi, Mio, Pence
Plan for Executive Session and subcommittee meetings – all

The meeting was adjourned at 4:42 pm.
TAB 5
Extension of SOCED Strategic Plan
In December, the SOCED Executive Committee voted to extend the 2019-2021 SOCED Strategic Plan by one additional year. SOCED will be asked to approve this extension during the 2022 Spring meeting. SOCED Vice-Chair Mike Adams will continue to shepherd the implementation of the current plan and the development of the next.

Update to Supporting Excellence in Education Subcommittee Charge
In December, the SOCED Executive Committee voted to approve changes to the Supporting Excellence in Education Subcommittee charge related to programming.

<table>
<thead>
<tr>
<th>Original Charge</th>
<th>Revised Charge</th>
</tr>
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<tbody>
<tr>
<td>Organizes and facilitates programming at ACS-sponsored meetings that reflect</td>
<td>Organizes and facilitates workshops at ACS-sponsored meetings and other</td>
</tr>
<tr>
<td>practices informed by education research and evidence.</td>
<td>professional learning opportunities, based on the needs of the community,</td>
</tr>
<tr>
<td></td>
<td>that reflect practices informed by education research and evidence.</td>
</tr>
</tbody>
</table>

Joint Efforts with the Committee on Professional Training
The SOCED and CPT chairs met in January, continuing discussions on possible collaborations between the two committees and how to work together more effectively. Making chemistry education more inclusive and equitable will be the focus of the joint SOCED/CPT luncheon at ACS Spring 2022.

ACS Fellows Nomination
MaryKay Orgill is chairing a working group to review the ACS Fellow qualifications and prepare the SOCED nomination packet for the 2022 awards cycle. In November, the SOCED Executive Committee voted to approve the revised ACS Fellows nomination process proposed by the task force.

Inclusive Science Education
The ACS comment “Shaping a more inclusive and responsive STEM education system” in the September 27, 2021 issue of Chemical & Engineering News requested input for the revision of the Science Education Policy statement and encouraged the chemistry community to engage in the policy process.

SOCED Budget
The 2022 SOCED budget is included in Tab 5 of the agenda book. This budget covers all meeting expenses for the committee.

ACS Spring 2022 Meeting Events
SOCED members and associates are encouraged to attend the ACS Student Chapter Awards reception, the Undergraduate Research Poster Sessions (virtual and in-person), the Graduate Student and Postdoctoral Scholars Reception, and other student programming.

ACS Presidential Events & Symposia and Keynote Events may also be of interest.
**Special Projects**
ACS is undertaking several special projects addressing key issues in education.

- **Fostering a Skilled Technical Workforce** is one of the four transformational [ACS strategic initiatives](https://www.acs.org/content/acs/en/strategic iniciatives.html) that ACS will support over the next five years.

- The **Lasting Encounters between Aspiring and Distinguished Scientists (LEADS) Conference**, an initiative of the 2020 ACS President Luis Echegoyen, will be an in-person 3-day event focused on preparing a diverse group of high-potential young professionals and students for successful and impactful careers that address global grand challenges.

- The ACS Bridge Project and development of the [Inclusive Graduate Education Network](https://www.graduateeducationnetwork.org/) is supported by the NSF Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering & Science (NSF INCLUDES) program, along with funding from industry partners. More information about the ACS Bridge Program and ACS Bridge Professional Development, a collection of activities designed to increase the number of underrepresented minority students who receive doctoral degrees in chemical sciences, is available at [www.acs.org/bridge](http://www.acs.org/bridge).

- **Get the Facts Out** is supported by the NSF Improving Undergraduate STEM Education initiative. More information about the toolkit and other activities designed to change perceptions about K-12 teaching and increase the number of chemistry majors who enroll in teacher certification programs is available at [www.acs.org/GetTheFactsOut](http://www.acs.org/GetTheFactsOut).

- Impact Indicators and Instruments for Individual Development Plans is supported by the NSF Innovations in Graduate Education program. More information is available at [I3IDP.org](https://i3idp.org).

**Petitions and Council Actions**
At its [Spring 2022 meeting](https://www.acs.org/content/acs/en/meetings/2022-spring.html), Council will vote on two petitions to:

- Amend Use of Dues (from the Committee on Budget & Finance)
- Amend Duties of Committee on Chemists with Disabilities (from the Committee on Chemists with Disabilities)

Council will also vote on:

- 2023 Schedule of Membership (from the Membership Affairs Committee)
- Extension of market testing of international dues discount (from the Membership Affairs Committee)
- Charter of ICSC – Switzerland (from the International Activities Committee)
- Divisional Name Change – CARB (from the Divisional Activities Committee)
Society Committee on Education  
Report to Council

This report updates the Council on SOCED’s progress in implementing the actions to which it agreed in Fall 2021 and highlights significant accomplishments of the Society’s education programs.

SOCED’s three subcommittees (Science Education Policy, Promoting Excellence in Education, and Student Communities), along with a collection of advisory boards and working groups, are engaging a range of experts and stakeholders from across the education community, developing interactions and collaborations in pursuit of the SOCED vision, mission and goals.

Vision: The future of chemistry teaching and learning

Mission: Develop and implement policies and resources to advance chemistry education and to connect its diverse communities

Goal 1: Promote effective chemistry education

Goal 2: Foster collaborative and sustainable environments for emerging and existing communities in chemistry education

Goal 3: Identify opportunities and approaches for communication and collaboration among education stakeholders

SOCED activities also help advance several goals of the ACS Strategic Plan, including Goal 3 (support excellence in education), Goal 2 (empower members and member communities), and Goal 5 (embrace and advance inclusion in chemistry). The committee is committed to ensuring that the Society’s core values are reflected in SOCED and ACS Education activities.

Science Education Policy
The SOCED charge includes developing reports and recommendations to the Board and Council on Society policies related to chemical education. The Science Education Policy Subcommittee is revising the Science Education Policy statement to:

- amplify the focus on underserved and underrepresented communities in the science, technology, engineering, and mathematics (STEM) education system;
- allow for flexibility around emerging trends and methods of teaching and learning in response to virtual learning, calls for broadband access, and other areas; and
- incorporate key aspects of two policy statements, the Importance of Hands-on Laboratory Science and the Teaching of Evolution, into the larger statement.

The ACS comment “Shaping a more inclusive and responsive STEM education system” in the September 27, 2021 issue of Chemical & Engineering News requested input for the revision and encouraged the chemistry community to engage in the policy process.

Supporting Excellence in Education
SOCED is also charged with advising on matters relating to chemical education. The Supporting Excellence in Education Subcommittee is considering the design and implementation of ACS Education programs, products, and services. These include the following:

- Professional development activities, such as the New Faculty Workshops and the Postdoc to Faculty Workshop, were held virtually in 2021 with plans to resume in-person events in 2022.
- A range of events and activities continue to support Get the Facts Out, now in its 4th year of NSF-funding, and its informational campaign about the grades 7-12 teaching profession,
designed to reach STEM majors in a large fraction of all U.S. mathematics, chemistry and physics departments. The number of chemistry champions is growing as are the numbers of chemistry faculty members aware of the project and using its research-based resources.

- The American Association of Chemistry Teachers (AACT) continues to expand its collection of resources, including webinars, an online resource library, and ChemMatters digital archive. For the 2021-2022 school year, 256 Science Coaches partnerships were initiated. In the 2021 AACT member survey, satisfaction increased along almost every measurable category. AACT ended 2021 with 8,725 members, an 8.5% increase since 2020.

Opportunities and challenges related to K-12 and higher education, such as leveraging theory, evidence, and effective practices, are also being considered.

**Student Communities**

As it fulfills its responsibilities regarding ACS Student Chapters, SOCED is also providing guidance regarding programs, products, and services for high school, undergraduate and graduate students, as well as postdoctoral scholars. These include the following:

- The US National Chemistry Olympiad program is broadening the diversity of high school students participating by offering webinars, coaching sessions, and recruitment grants.
- Grants for student communities were expanded in 2021, offering a total of 52 ACS Student Group Development and Engagement Grants and 22 ACS DEIR Faculty Advisor/Chapter Officer Grants. In 2022, ACS Student Communities Engagement Grants and ACS Student Communities DEIR Grants will be available on a first-come, first-served basis.
- The ACS Graduate Student Organizations (GSO) program, launched in 2020, now has 10 GSOs, three of which focus on safety, and one of which focuses on career and professional development.
- There are now 93 ACS International Student Chapters chartered in 29 countries.
- Reports for 2020-2021 activities were received from 223 domestic and 22 international student chapters, reporting on over 4900 and over 430 activities, respectively. The ACS Student Chapter Awards program is recognizing 49 outstanding, 72 commendable, and 86 honorable mention chapters for 2020-2021 activities.

Councilors and ACS Spring 2022 attendees are encouraged to attend the ACS Student Chapter Awards ceremony, to be held on Sunday, March 20, as well as the Undergraduate Research Poster Sessions, the Graduate and Postdoctoral Reception, and other student programming.

Collaborative activities continue to enhance progress towards fulfilling the educational goals of ACS and SOCED. A partnership with the Younger Chemists Committee facilitated the involvement of 14 undergraduate students, three of whom represented international student chapters, in the 2022 ACS Leadership Institute. SOCED and the Division of Chemical Education coordinate efforts ranging from meeting programming to supporting the American Association of Chemistry Teachers (AACT).

Questions and suggestions regarding SOCED activities, current and potential, can be sent to education@acs.org.

Carmen Gauthier, Chair
**Summary**
The continued COVID-19 pandemic meant many Chemistry Festival grant winners had to change their plans or postpone their programming in 2021. However, some events were able to take place with participants wearing masks. A more complete summary of events will be provided in the next report.

The Festival Training Institute (FTI) was originally scheduled to be hosted by ACS Nigeria in Sunyani, Ghana with the ACS Student Chapter at the University of Energy and Natural Resources. However, international travel was not possible and a virtual event was not feasible. Instead, efforts were focused on organizing a virtual Student Chapter Summit for chapters in India. This summit included leadership information and used material from the FTI to demonstrate how science outreach can be a useful and strategic activity for student chapters, in addition to their positive impacts on the community.

FTI 2022 Nigeria/Ghana is tentatively scheduled for June of this year. The next location and format of the FTI is currently undecided.

Twenty Chemistry Festival grants were awarded in the first round of 2022. Reviewers from the Committee on Community Activities, Committee on International Activities, and the Society Committee on Education are thanked for their continued service. The next round of grants is scheduled to open in early July, 2022.

| 2021 Awards | Student Chapter - University of Energy and Natural Resources  
Venezuelan Association for Chemistry Olympiads  
Dr. Cesar A. Urbina Blanco  
Student Chapter - Universidad de los Andes  
Athens Science Festival  
International Chemical Sciences Chapter - Thailand  
Student Chapter - Sam Higginbottom Institute of Agriculture, Technology, & Sciences  
Student Chapter - Universiti Sains Malaysia  
Proposed ACS Uruguay  
International Chemical Sciences Chapter - Iraq  
Student Chapter - University of Uyo  
International Chemical Sciences Chapter - Peru  
Student Chapter - American University of Sharjah  
International Chemical Sciences Chapter - Romania  
International Chemical Sciences Chapter - Shanghai  
International Chemical Sciences Chapter - Brazil  
University of the West Indies, Trinidad and Tobago  
Student Chapter - Sokoto State University  
Student Chapter - Universidad Nacional de Colombia - Sede Bogotá  
Student Chapter - National Open University of Nigeria, Ibadan Study Center  
Student Chapter - Nnamdi Azikiwe University  
International Chemical Sciences Chapter - Pakistan  
Tanzania Chemical Society  
Student Chapter - Shiv Nadar University  
International Chemical Sciences Chapter - Peru |
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<th>University of Otago</th>
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<tr>
<td>Student Chapter - Quaid-E-Awam University</td>
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<td>Student Chapter - University of Dhaka</td>
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<td>University of Education, Winneba Ghana</td>
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<td>Student Chapter - University of Ilorin</td>
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<td>International Chemical Sciences Chapter - Jordan</td>
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<td>Student Chapter - Ladoke Akintola University of Technology</td>
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<td>Student Chapter - Dr. Ambedkar College, Deekshabhoomi</td>
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<th>Student Chapter - National Open University of Nigeria, Ibadan Study Center</th>
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<td>Student Chapter - Qatar University</td>
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<td>Student Chapter - Nazarbayev University</td>
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<td>Student Chapter - Tecnológico de Costa Rica</td>
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<td>Student Chapter - Universiti Kebangsaan Malaysia</td>
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<td>Athens Science Festival</td>
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<td>Student Chapter - J C Bose University of Science and Technology, YMCA</td>
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<td>Baddi University of Emerging Sciences and Technology, India</td>
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<td>Student Chapter - Universidad Nacional de Colombia - Sede Bogotá</td>
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<td>Student Chapter - University of Ilorin</td>
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<tr>
<td>Proposed ACS Uruguay</td>
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Shaping a more inclusive and responsive STEM education system

CARMEN V. GAUTHIER, CHAIR, ACS SOCIETY COMMITTEE ON EDUCATION

As students and educators in the US continue to grapple with the COVID-19 pandemic and call for investment in infrastructure for teaching and learning, American Chemical Society members have an opportunity to help shape the future of the science education ecosystem. The society’s advocacy around federal policy making related to education is guided by the ACS Science Education Policy position statement. Your input will help ensure that the statement and ACS’s actions are responsive to the needs of the chemistry enterprise.

Within ACS, those needs are championed by the Society Committee on Education (SOCED). Over the past year, SOCED has worked to implement a new structure that better aligns with the committee’s roles and responsibilities. To more comprehensively guide the collection of ACS policies and programs across educational levels, SOCED formed three new subcommittees: Science Education Policy, Supporting Excellence in Education, and Student Communities.

The work of the new SOCED Science Education Policy subcommittee is timely, given the strain on education systems throughout the COVID-19 pandemic and the greater commitment to addressing longstanding and entrenched inequities in both access and quality of science education. The Science Education Policy statement is due for revision in 2022, giving the subcommittee the opportunity to create a more responsive and inclusive statement to empower ACS and its members to drive policy changes within the US government.

ACS Public Policy Statements are designed to cover areas of importance to the chemical and scientific enterprise, drawing on the expertise of members to shape ACS messages to policy makers. Governance committees with expertise on the issues recommend the statements to the Board Committee on Public Affairs and Public Relations (PAPR). The statements are then vetted by PAPR on behalf of the ACS Board of Directors. Once PAPR approves a statement, the ACS government affairs team creates advocacy strategies and member engagement campaigns around the society’s policy priorities.

SOCED has primary jurisdiction over three statements: Science Education Policy, Teaching of Evolution, and Importance of Hands-on Laboratory Science. SOCED also lends support to other committee writing teams that manage additional statements, including Science and Technology in the Budget, Workforce-Related Immigration, and Visas for Scientific Collaboration and Academic Study.

The SOCED Science Education Policy subcommittee has been tasked with revising the current Science Education Policy statement in the following ways:

- amplifying the focus on underserved and underrepresented communities in the science, technology, engineering, and mathematics (STEM) education system
- allowing for flexibility around emerging trends and methods of teaching and learning in response to virtual learning, calls for broadband access, and other areas
- incorporating the Teaching of Evolution and Importance of Hands-on Laboratory Science ACS position statements into the larger statement

The subcommittee has begun meeting, sharing edits, and pulling together expertise from across SOCED to consider the key points for federal policy makers. How can policy makers promote lifelong, rigorous education of science concepts and practices? How can they provide adequate state and federal support for science education? How can they encourage students of all backgrounds in the pursuit of education and careers in STEM fields? What investments need to be made in the science education system, from K–12 to higher education? As the draft comes together, we will ask for feedback from ACS members, committees, advisory boards, and other networks within the society.

We also invite you to engage with the policy process through the following opportunities:

- Review the Science Education Policy statement and submit comments and suggestions to the SOCED Science Education Policy subcommittee at education@acs.org.
- To view the entirety of ACS Public Policy Statements, visit www.acs.org/policy.
- Join ACS Act4Chemistry, the legislative action network designed to inform members on issues of importance to the chemistry enterprise and to provide opportunities for easy engagement with federal legislators. For more information, visit www.acs.org/act4chemistry.
- Enroll in the Chemistry Advocacy Workshop, which takes roughly 2 h for participants to complete. It can be split into small sections and includes four modules—an introduction to chemistry advocacy, fundamentals of the US government structure, congressional advocacy, and effective communications. You can enroll in the advocacy workshop by visiting www.acs.org/chemistryadvocacy.

As Jennifer Nielson, 2020 chair of SOCED, wrote in her Nov. 15, 2020, Comment, “The chemistry community has a unique opportunity to not just survive but thrive by becoming aware of the challenges of creating inclusive education and using new understanding and technologies to solve those challenges.” She also noted, “Developing skills and science understanding and preparing students at all levels . . . require that each of us plays a part.” Everyone can support the process of developing ACS public policy statements and their role in the society’s advocacy. Send your insights and questions to education@acs.org.

Views expressed are those of the author and not necessarily those of C&EN or ACS.
American Chemical Society  
Statement of Revenues and Expenses  
Education Committee - SOCED (A81421)  
For the Calendar Year 2022  
($000 Omitted)

<table>
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<tr>
<th>CHANGES IN UNRESTRICTED NET ASSETS</th>
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<td><strong>Expenses</strong></td>
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<td>Building and Office Operations</td>
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<td>Travel</td>
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<td>Other</td>
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<tr>
<td><strong>Total Expenses</strong></td>
<td>54</td>
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<tr>
<td><strong>Total Net Expenses</strong></td>
<td>$ (54)</td>
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</tbody>
</table>
ConC Liaison Presentation to Committees

Committee on Committees (ConC)
Spring 2022

New Online Preference Form

Committee on Committees (ConC)
NEW Online Preference Form

• Open to everyone
  – No longer required to request permission to gain access
• Filtering functionality allows users to review each committee by:
  – Its main topic and focus
  – Skills and expertise needed
• Users will submit a skills assessment
• New functionality to make the committee preference selection process more informative and user friendly

NEW Online Preference Form

• New data fields
  – Employment Sector
  – Primary and secondary fields of focus in chemistry
• Users submit a paragraph with primary interest and motivation for serving in each selected committee
• Opening in mid-April
• Closing in mid-July
• More information will be provided closer to the launch
Who Should Complete the Online Preference Form?

- Associates & Consultants **must complete** every year
- A member up for reappointment on their current committee
  - Can select current committee as first choice
  - Can select a new committee as first choice
- A member who has reached the statutory limit (term limit) on current committee
- Only members who are up for reappointment or reached the statutory limit can complete the form
  - You will be redirected to another page if you are in the middle of a term
  - mid-term appointments are **rarely granted**

Make Sure…

- You select other committees you may be interested in
  - Choose no less than 2, but up to 4 committees
- If your **member** term is **not** expiring this year, it is automatically showing your current assignment
- Your contact information is up to date
- Your biography is current
- If you need assistance: **secretary@acs.org**
Interested in a Committee…

• Checkout the ACS website (www.acs.org/governance) for more information about the committee(s)
• Review their reports to Council (oral and written): www.acs.org/Councilors
• Contact the Chair, staff or ConC liaison
• Attend their Open Meeting

Questions
2023 Committee Appointment Process

Committee on Committees (ConC)

ACS Council-related Committees

- **All** Council-related Committees are “Society Committees”
  - Including CPC, ConC, and N&E (Elected Committees)
- Committee appointments are open to all
  - No “Councilor only” requirement
    - Except CPC, ConC, and N&E (Elected Committees)
- ACS Membership must be in good standing, unless the appointing officer(s) [ACS President and/or Board Chair] make an exception
Committee Terms & Size

- Consistent terms (3-year) for members, with a maximum of two terms
  - Associate and consultant appointments are for one year
  - Term can be extended if the appointing officer(s) determines that there is a compelling need for ongoing expertise on the committee
- Consistent maximum size for all committees (12 to 20 Members)
  - Except associates and consultants

Committee Positions

- Chair
  - Term: Limited to three consecutive one-year terms as Chair of the committee
  - Role: Leads committee & activities, votes on official committee actions
- Members
  - Term: 3-year term, with a maximum of two terms
  - Role: Contribute to activities, vote on official committee actions.
Committee Positions (cont.)

• **Associates**
  - **Term:** One year appointment; renewable appointments, depending on committee and available member slots.
  - **Role:** Learn about the committee, contribute to activities, participate in “sense of the committee” votes.

• **Consultants**
  - **Term:** One year appointment or until assignment is complete (generally <5 years).
  - **Role:** Provide specialized knowledge, expertise, and/or experience. Likely to have specific assignment.

Committee Appointment Timeline

- **March/April**
  - Meet with Chair and staff liaison to discuss Chair recommendations for next year
  - Committee Preference Form Opens
  - Submit recommendations for Society Committee Chairs Reporting to Council

- **May/June**
  - Committee Chair recommendations reviewed and approved by the President-Elect for Society Committees reporting to Council
  - Committee Chairs notified

- **July**
  - Committee Preference Form Closes
  - Preference information sent to Chairs, Staff & ConC liaisons
### Committee Appointment Timeline

#### August/September
- Meet with Chair and staff liaison to discuss recommendations for all Society Committees [Members, Associates & Consultants, including Society Committee Chairs reporting to Board and Council]

#### October/November
- Submit recommendations for all Society Committees
- Recommendations reviewed and approved by the President-Elect for Society Committees reporting to Council [Members, Associates & Consultants]
- Notifications are sent

#### December
- Recommendations reviewed and approved by the President-Elect and Board Chair for Society Committees reporting to the Board and Council [Chairs, Members, Associates & Consultants]
- Notifications are sent

### Society Committees Reporting to Council
- Analytical Reagents (CAR)
- Committees (ConO)*
- Constitution & Bylaws (C&B)
- Council Policy (CPC)*
- Divisional Activities (DAC)
- Economic and Professional Affairs (CEPA)
- Ethics (ETHX)
- Local Section Activities (LSAC)
- Meetings and Expositions (M&E)
- Membership Affairs (MAC)
- Nomenclature, Terminology and Symbols (NTS)
- Nominations and Elections (N&E)*
- Project SEED (SEED)
- Technician Affairs (CTA)

*elected by the ACS Council

### Society Committees Reporting to both Board & Council
- Budget and Finance (B&F)
- Chemical Safety (CCS)
- Chemistry and Public Affairs (CCPA)
- Chemists with Disabilities (CWD)
- Community Activities (CCA)
- Education (SOCED)
- Environmental Improvement (CEI)
- International Activities (IAC)
- Minority Affairs (CMA)
- Patents and Related Matters (CPRM)
- Professional Training (CPT)
- Publications (PUBS)
- Public Relations and Communications (CPRC)
- Science (COMSCI)
- Senior Chemists (SCC)
- Women Chemists (WCC)
- Younger Chemists (YCC)
Society Committees either report only to Council, or report jointly to Council and the Board. Three Society Committees are elected.

The **Council** consists of Local Section Councilors, Division Councilors, Ex Officio Councilors, Bylaw Councilors, and Nonvoting Councilors.

The **Board of Directors** consists of the President, President-Elect, Immediate Past President, six District Directors, six Directors-at-Large, and the Chief Executive Officer, Ex Officio.*

*non-voting member of the Board of Directors

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**Questions**
2022 National Committee Census

Committee on Committees (ConC)

2022 National Committee Census

- Formerly Committee Demographic Survey
- Launched March 1, 2022
- Census will be administered every other year
- 31 Council-Related Committees Committee Personnel (Committee Chairs, Members, Associates & Consultants)
- All information is collected and processed by Survey, Design & Analysis (SDA)
- Closes April 12, 2022
2022 National Committee Census

- Broaden ACS member awareness of the variety of race/ethnicity, gender, sexual orientation, and employment sector representation
- Provide snapshot of committee demographic picture
- Information collected for “data” purposes only and will not be correlated with any opinions or performance of the individual providing the information
- The survey is not the basis for an assignment on an ACS Committee
Professional Training

In support of its vision to maintain and lead excellence in training chemistry professionals in the 2020s, the Committee on Professional Training’s (CPT’s) portfolio now contains almost 700 colleges and universities with ACS approved chemistry programs. In 2020-21, these programs graduated over 12,000 students with bachelor’s degrees in chemistry and over 7,500 students with bachelor’s degrees in biochemistry.

Bachelor’s Degree Recipients 2020-2021: Gender, Ethnic, and Racial Diversity

ACS approved programs conferred almost 20,000 bachelor’s degrees in 2020-21. The gender diversity for these graduates is shown below in Figure 1. The racial and ethnic diversity for these graduates is shown in Figure 2.

Approval and Review Statistics: While most academic programs did not return fully to face-to-face instruction in 2020-21, the ACS approval and review process continued without interruption. Since our last report in spring 2021, CPT has held 3 meetings (all virtual due to the COVID-19 pandemic), the most recent in January 2022, to review periodic reports. Committee members also reviewed applications for programs interested in obtaining ACS approval. Since the fall 2021 meeting, an additional 13 programs have joined the ACS Approved Program cohort.

CPARS Reporting: The Chemistry Program Approval and Review System (CPARS) has been fully operational for two years. Programs submit all reports via this database system. CPT reviews of these reports also occur within the database. The power of collecting information via a database is that it provides ACS with data essential to understanding the current academic landscape. For example, CPT was able to collect information on the mode of instruction for chemistry majors in either general or organic chemistry (Figure 3). Data examining the gender diversity from bachelor’s degree recipients to first year graduate students to Ph.D. recipients to Full Professors has clearly shown a widening gap in gender present in that career path (Figure 4).

Guidelines Revision: CPT’s mission focuses on providing guidelines and setting standards for the training of chemistry professionals. The committee continued its work in developing and revising the ACS Guidelines for Bachelor’s Degree Programs to both promote effective practices and encourage innovations in chemistry education and expects to publish the revised version late in 2022. Modifications to the current guidelines will include: 1) a focus on the development of professional skills and competencies; 2) promotion of a comprehensive view of safety; and 3) recommendations for advancing diversity,
equity, inclusion, and respect (DEIR) policies and educational practices in academic settings (these were published in the DEIR special edition of the Journal of Chemical Education (Guidelines for Advancing Diversity, Equity, Inclusion, and Respect in Programs Offering Bachelor’s Degrees in Chemistry) Michelle M. Brooks, Felicia A. Fullilove, Ashley B. Mahoney, and Edgar A. Arriaga, Journal of Chemical Education 2022 99 (1), 393-401 DOI: 10.1021/acs.jchemed.1c00493).

**Global Activities:** A working group within CPT has been exploring options for the evaluation of undergraduate chemistry programs internationally and, in 2021, completed a pilot program focused on the recognition of global programs in the chemical sciences. CPT voted to approve the process and evaluation of these programs and plans to launch the ACS Recognition program in 2022. ACS Recognition for these programs means that these programs align with the ACS international guidelines. More information on this program and the guidelines is available on the website ([launched in October 2021](#)).

**CPT Response to COVID-19:** CPT provided guidance in 2020 to approved programs affected by COVID restrictions. The temporary adjustment of the Guidelines provided flexibility to programs and their majors in a variety of areas including frequency of course offerings, virtual laboratory experiences, and pass/fail grading. The adjustments to the guidelines have been extended to June 30, 2022 and will be re-evaluated at the spring (March 2022) meeting.

Scott Reid
Chairperson

Gregory A. Caputo
Vice-Chairperson

**FULL MEMBERS**
Néstor M. Carballeira
Bill Carroll
Gina Frey
Kimberley A. Frederick
Jani C. Ingram
Susan M. Kauzlarich
Sunghee Lee
Cora E. MacBeth
Ashley Mahoney
Lisa McElwee-White
Maureen Ngoh
Barbara A. Reisner
Santiago Sandi-Ureña
Leyte L. Winfield

**CONSULTANTS**
Edgar A. Arriaga
Joseph J. Provost

**ASSOCIATES**
Benny Chan
Renee S. Cole
Deborah C. Bromfield-Lee
Julie T. Millard
Chi K. Nguyen
Dominic S. Peterson
Pamela Riggs-Gelasco
Barbara Sawrey
Kevin H. Shaughnessy
Greg Van Patten

**ConC LIAISON**
Brian Mathes

**ACS STAFF LIAISON**
Michelle M. Brooks

**ACS ASSISTANT LIAISON**
Felicia A. Fullilove

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*Figure 4:* The percentage of females in chemistry from undergraduate to full professors. Data were collected from ACS Approved institutions via annual (bachelor’s degrees, graduate students, doctoral degrees) and periodic reports (assistant and full professors).
Women Chemists Committee

WCC is excited to offer programming and events that support our mission to attract, retain, develop, promote, and advocate for women to positively impact diversity, equity, and inclusion in the Society and the profession. In addition to the sold-out WCC Luncheon, the WCC is excited to showcase the following events:

Women Networking Breakfast (open event)
Monday, March 21, 7:30 am–9:00 am, Hilton San Diego Bayfront, Aqua Salon D

ACS Award for Encouraging Women into Careers in the Chemical Sciences in honor of Mindy Levine
Monday, March 21, 8:00 am – 11:00 am, Marriott Grand Ballroom Section 12

Advancements from Advance
Monday, March 21, 2:00 pm – 6:00 pm, Marriott Grand Ballroom Section 12

WCC Just Cocktails
Monday, March 21, 5:00 pm–6:00 pm, Hilton San Diego Bayfront, Aqua Salon A-B

WCC Rising Star Award Symposium
Tuesday, March 22, 8:00 am – 11:30 am, Marriott Grand Ballroom Section 12

WCC–Eli Lilly Travel Award Poster Session
Tuesday, March 22, 11:00 am–12:00 pm, Hilton San Diego Bayfront, Aqua Salon A-D

The WCC is always excited to help deserving chemists get recognition for their hard work. Please visit www.acswcc.org to review all of the award opportunities and find information on how to apply for these awards.

If you would like to share your Committee or Division ideas for collaborations with the WCC, please contact Amy Balija at wcc@acs.org to join our Executive Session on Saturday, March 19 to give a brief overview of your collaborative interests.
• **Individual private donors**

The ACS USNCO staff appreciates the dedication, enthusiasm, and contribution of time given by:

• The 2021 members of the USNCO Subgroup of the Society Committee on Education, which provided policy direction for this program,

• The members of the USNCO examinations task forces, the grading team, and the mentor selection task force,

• The faculty of the Department of Chemistry and Biochemistry of UMD College Park, and

• The mentors and peer mentors who taught and guided the 2021 Alpha Xi Team.

Thank you!

Study Camp participants, mentors, and ACS staff in a group photo collage by Yitian Zhu.
TAB 8
## SOCED Supporting Excellence in Education (SEE) Subcommittee

**February 2022 ACS Meeting**

**Friday, February 18, 2022**

**11:00 AM – 12:15 PM**

*Zoom Technologies*

### Members
- Tracy Halmi (SEE chair)
- Sandra Bonetti
- Daniel King
- Sam Pazicni (H-E Subgroup chair)
- Ellen Yezierski

### Associates
- Roxie Allen
- Russ Carley
- Kevin Gable
- Tyler Kinner (K-12 Subgroup chair)
- Amy Nicely
- Missy Postlewaite
- Armando Rivera-Figueroa

### ACS Staff
- Terri Chambers (SEE staff liaison)
- Lisette Gallegos (K-12 Subgroup liaison)
- Natalia Martin (H-E Subgroup liaison)

### Time | Topic | Documentation |
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<td>11:00 am EDT</td>
<td>Welcome &amp; Introductions</td>
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| 11:05 am EDT | Chair’s Report  
- Review Subcommittee Charge  
- SOCED Meeting San Diego | SEE Subcommittee Charge |
| 11:10 am EDT | Subgroup updates (Information/Discussion)  
Chairs of the SEE K – 12 and SEE Higher Education Subgroups will each provide a brief overview of previous and upcoming subgroup activities. |  |
| 11:30 am EDT | Academic Integrity (Discussion)  
Disruptions in teaching and learning caused by the COVID-19 pandemic coupled with the rise of “study-help sites” such as Chegg have led to an increase in concerns and conversations within the chemistry community about academic integrity. Copyright infringement, compromised student learning and assessment, and student-expressed grade pressures are among the many issues that members of the chemistry community have raised. The subcommittee will discuss opportunities, challenges, and strategies for promoting academic integrity. | Student Cheating and the Fraud Triangle  
Overview of ACS Ethics Resources |
| 12:15 pm EDT | Adjourn |  |
Supporting Excellence in Education (SEE) Subcommittee Charge

Chaired by a member or associate of SOCED. Comprised of members, associates and consultants of SOCED. When feasible, the consultant from the Division of Chemical Education will serve on this subcommittee. Chairs of the subgroups associated with this subcommittee will also serve as members and serve as the representative for their subgroup.

- Advises ACS Education on opportunities and challenges related to the education ecosystem. Ensures the Society’s core values are reflected in the design and implementation of ACS Education programs, products, and services.
- Organizes and facilitates workshops at ACS-sponsored meetings and other professional learning opportunities, based on the needs of the community, that reflect practices informed by education research and evidence.
- Recommends and fosters collaborative efforts with internal and external education stakeholders.
- Oversees the appointment process to build diverse and inclusive subgroups that connect stakeholders with unique perspectives and expertise.

Supporting Excellence in Education (SEE) K–12 Subgroup

As a subgroup of the Supporting Excellence in Education subcommittee, SEE K-12 focuses on chemistry and science learning across grade levels in K-12. SEE K-12 will be chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The chair of the Supporting Excellence in Education subcommittee and the chair of SOCED must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

SEE K-12 Subgroup Standing Goals:

- Serve as a voice for the K-12 community by discussing and providing guidance on K-12 chemistry education and other education topics based on trends, research, and effective practices*
- Survey K12 education stakeholder groups to inform the work of the subgroup, SEE, and SOCED
- Assesses the needs for professional development in K-12 and recommends to the SEE subcommittee topics and venues for workshops and other professional learning opportunities.
- Every five years, convene a task force charged with reviewing and revising the Guidelines and Recommendations for Teaching Middle and High School Chemistry
- Work with ACS staff to facilitate the judging and selection of finalists for the Outstanding High School Student Program and Outstanding Kids & Chemistry ChemLuminary Awards
- Interface regularly with ACS-Hach Advisory Board, ChemMatters Policy Board, the AACT Governing Board, and other groups who advance K-12 education to inform and advance the work of the subgroup and SOCED

Supporting Excellence in Education (SEE) Higher Education Subgroup

As a subgroup of the Supporting Excellence in Education subcommittee, SEE HE focuses on chemistry and science learning in higher education. SEE HE will be chaired by a member or associate of SOCED.
Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The chairs of SOCED and its Supporting Excellence in Education subcommittee must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

SEE Higher Education Subgroup Standing Goals

- Every five years, convene a task force charged with reviewing/updating the Guidelines for Chemistry in Two Year College Programs (last updated in 2015).
- Advise ACS Education on key decision points regarding higher education products, programs, and services, as well as other initiatives in development.
- Assesses the needs for professional development in higher education and recommends to the SEE subcommittee topics and venues for workshops and other professional learning opportunities.
- Interface regularly with the Committee on Professional Training, the Division of Chemical Education, the Graduate Student and Post-Doctoral Scholars Advisory Board, and the Undergraduate Student Advisory Board to inform and support the work of the group.
Supporting Excellence in Education Subcommittee – K12 Subgroup (SEE-K12) Spring 2022 Report

SEE-K12 Subgroup
Sandra Bonetti, Beth Eddy, Tyler Kinner (chair), Pamela Leggett-Robinson, Amiee Modic, Antoine Shade

SEE K-12 Subgroup
As a subgroup of the Supporting Excellence in Education subcommittee, SEE K-12 focuses on chemistry and science learning across grade levels in K-12. SEE K-12 will be chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The chair of the Supporting Excellence in Education subcommittee and the chair of SOCED must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

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- Interface regularly with ACS-Hach Advisory Board, ChemMatters Policy Board, the AACT Governing Board, and other groups who advance K-12 education to inform and advance the work of the subgroup and SOCED

K-12 Subgroup Goals for 2022
1. Collaborate with DivCHED and AACT to explore perspectives and ideas related to programming, resources, etc. focused on the translation of research to practice for K12 chemistry and chemistry-related learning. Examples could include concept inventories, learning taxonomies, planning for student assessment of learning, thematic frameworks, laboratory innovations, etc.
2. Convene a task force to plan the update and revision of the Guidelines and Recommendations for Teaching Middle and High School Chemistry to begin in 2022
3. Initiate a stakeholder study of anticipated users for the Guidelines and Recommendations

SEE-K12 Activities Spring 2022

Priorities for Excellence in Education K12
The following priorities were discussed by the subgroup as priority goals for 2022:
- Primary Goal: Complete majority of the review and update of the Guidelines for Teaching Middle and High School Chemistry.
- Secondary Goal: Dialogue with other ACS units involved in K12 education regarding the integration of research and practice.
Primary Goal: Review/Update of Guidelines for Teaching Middle and High School Chemistry

The subgroup has begun the review and update process for the Guidelines for Teaching Middle and High School Chemistry. Subgroup members are currently reviewing the guidelines in an effort to identify key areas of focus for the next edition. Subgroup members will continue meeting this spring to discuss in detail what the update will look like and identify next steps in the revision process.

It was noted that this update will be guided in part by the ACS Strategic Plan (strategy.acs.org), particularly focusing on goal 3 of supporting excellence in education and the core values. The group noted the importance of incorporating the core value of Diversity, Equity, Inclusion, and Respect (DEIR), as it is a new core value added since the last iteration of the guidelines was released. The subgroup plans to incorporate DEIR throughout the review process. It is intended that DEIR will be included in the updated Guidelines throughout sections where relevant DEIR insights are present; this in lieu of creating a section labeled “DEIR”.

Secondary Goal: Advocate for the integration of research and practice in collaboration with other ACS K12-involved units

The subgroup discussed various ideas for potential exploration and discussions with other ACS units involved in K12 education with the goal of improving the translation of knowledge among researchers and practitioners as it relates to K12 chemistry education. The following areas of opportunity were discussed:

- Virtual and hybrid learning in a post-pandemic environment
- Connecting CER to other areas of research that influence K12 instruction
- Incorporating K12 administrators into the K12 chemistry conversation
- Supporting teachers in assessment design aligned to the 3D learning of the NGSS
- Creating opportunities for practitioners and researchers to “bridge the gap” and better understand one another’s practices
- Culturally-relevant pedagogy and thematic frameworks; how to make chemistry relevant to learners
Supporting Excellence in Education Subcommittee - Higher Education Subgroup (SEE-HE) Spring 2022 Report

SEE-HE Subgroup

Thomas Bussey, Peg Harbol, Dan King, Natalia Martin (staff liaison), Suazette Mooring, Sam Pazicni (chair), ChaMarra Saner, Clarissa Sorensen-Unruh, Paulette Vincent-Ruz, Leyte Winfield

SEE Higher Education Subgroup

As a subgroup of the Supporting Excellence in Education subcommittee, SEE HE focuses on chemistry and science learning in higher education. SEE HE will be chaired by a member or associate of SOCED. Membership for this subgroup is by invitation only and may include individuals who are not members or associates of SOCED. The chairs of SOCED and its Supporting Excellence in Education subcommittee must approve of the subgroup’s appointments. Subgroup members serve up to a three-year term.

Higher Education Subgroup Standing Goals

- Every five years, convene a task force charged with reviewing/updating the Guidelines for Chemistry in Two Year College Programs (last updated in 2015).
- Advise ACS Education on key decision points regarding higher education products, programs, and services, as well as other initiatives in development.
- Assesses the needs for professional development in higher education and recommends to the SEE subcommittee topics and venues for workshops and other professional learning opportunities.
- Interface regularly with the Committee on Professional Training, the Division of Chemical Education, the Graduate Student and Post-Doctoral Scholars Advisory Board, and the Undergraduate Student Advisory Board to inform and support the work of the group.

Higher Education Subgroup Goals for 2021-2022

1) review, provide feedback, and recommend next steps for the SOCED/DivCHED/CPT Resource Development Project
2) follow up on SOCED recommendation regarding student evaluations of teaching
3) draft a recommendation to the ACS to encourage the Kavli Foundation to incorporate chemistry education research into the Kavli lecture series (info: https://cen.acs.org/sponsored-content/acskavli-lectures.html)
4) draft a recommendation to JACS that the journal incorporate chemistry education research (not specific to the higher ed)
5) explore the development of a Chemistry version of CourseSource (https://www.coursesource.org/)
Priorities for Excellence in Education
Subgroup members ranked characteristics of a system that reflects excellence in education (see figure at right). It was concluded that the membership of this subgroup currently approaches the work related to excellence in education primarily from an equity and inclusion, and a responsiveness lens.

CPT/DivCHED/SOCED Resource Development Project
SEE-HE reviewed this collaborative project between SOCED, DivCHED, and CPT, aimed at unpacking the common concepts and vocabulary in the work of these three groups. The SEE-HE subgroup provided recommendations to: 1) include similar number of references for all the headings and check the included references to ensure a variety of perspectives; 2) disseminate the product intentionally, adjusted to the audience, and equitably across diverse faculty, which will require a multi-pronged approach; and 3) implement a multi-modal approach in the presentation of the work product: written, interactive, workshops, and webinars to engage faculty, as well as present the product in digestible smaller sections.

Issues Around Evaluating Chemistry Teaching in Higher Education
The subgroup discussed and provided feedback on “Issues Around Evaluating Chemistry Teaching in Higher Education and a Possible Role for SOCED in Providing Best-Practice Guidance to the Community”. The major issues with the current student evaluations of teaching (STE) relate to: the inefficacy and inequity of the assessments themselves; an overreliance on STEs; the modalities for implementation and distribution, and the use of collected data. The recommendations were the following: 1) ACS should become a signer on the American Sociological Association (ASA) statement; 2) ACS should prepare its own guidelines specific to chemistry, including equity-centered teaching evaluations. An equity framework is needed to ensure that diverse students are being served and that biases in evaluations do not have a punitive effect on faculty from marginalized groups; 3) SOCED could recommend CPT to encourage department to reflect on the use of assessment towards both instructor professional development and making programmatic improvements and DEI focused initiatives, as some departments already do. 4) “How to self-reflect on teaching” could be incorporated into the New Faculty Workshop (NFW) program; and 5) ACS as a professional society could connect with other professional societies and accrediting bodies to further coordinate more impactful responses.

Review/Update of Guidelines for Chemistry in Two Year College Programs
A chair has been appointed to the task force charged with reviewing/updating the guidelines. Through a meeting with 2-year colleges chairs, currently being planned in collaboration with the ACS Office of Professional Training, an assessment of community needs, and the identification of potential task force members will take place in Q1 2022.
**Society Committee on Education**  
**Student Communities Subcommittee Agenda**  
**Spring ACS Meeting – San Diego**  
**Thursday, February 24, 2022  2:00-4:00 PM EDT Via Zoom**

### Members
- Matt Mio (Chair)
- Michael Adams
- Michelle Boucher
- Milly Delgado
- Meledath Govindan
- Margaret Kanipes-Spinks
- Pamela Kerrigan
- Judy Kim
- Joshua Pak
- Kristine Smetana

### Associates
- Dana Emmert
- Irv Levy
- Sergey Nizkorodov
- Nicole Di Fabio
- LaTreasce Garrison
- Terri Chambers
- Lily Raines
- Joerg Schlatterer
- Jodi Wesemann

### ACS staff
- Nancy Bakowski
- Nicole Di Fabio
- LaTreasce Garrison
- Lily Raines
- Joerg Schlatterer
- Jodi Wesemann

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<td>2:00 pm</td>
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<td>Chair’s Report</td>
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<td>• SOCED Structure – upcoming schedule</td>
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<td>Academic Integrity (Discussion)</td>
<td>“Student Cheating and the Fraud Triangle” February 2016, Business Education Forum</td>
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<td>Disruptions in teaching and learning caused by the COVID-19 pandemic coupled with the rise of “study-help sites” such as Chegg have led to an increase in concerns and conversations within the chemistry community about academic integrity. Copyright infringement, compromised student learning and assessment, and student-expressed grade pressures are among the many issues that members of the chemistry community have raised. The subcommittee will discuss opportunities, challenges, and strategies for promoting academic integrity.</td>
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The 53rd International Chemistry Olympiad (IChO) was held remotely and organized by Japan from July 25 to August 2, 2021, 312 students from 83 countries participated in the competition. Team USA earned two gold and two silver medals.

The American Chemical Society (ACS), and other donors supported the participation of the U.S. Alpha Xi team. Qiyang Zhou from Princeton International School of Mathematics and Science, NJ (Princeton LS) and Yitian Zhu from Seven Lakes High School, TX (Greater Houston LS) earned gold medals; while Kien Phuong of Landon School, MD (Chemical Society of Washington) and Nikhil Seshadri from University City High School, CA (San Diego LS) won silver medals placing 13th, 27th, 42nd and 73rd respectively.

This year 141 Local Sections registered for the competition and the majority organized exams using printed exams administered in person, or a digital exam provided by USNCO office and proctored by local sections virtually using different platforms (Zoom, Teams etc.). 3407 students took the Local Exam in the ACS Learning Center between March 26 and 28, 2021. A total of 129 Local Sections nominated 858 students to sit for the digital national exam. Part II of the exam, consisting of eight free response problems, was administered virtually to the approximately 200 top students on April 24, 2021.

Twenty students who excelled on the national examination participated in a virtual USNCO study camp May 31-June 11, 2021 administered through the ACS Learning Center. Students received training in various major areas of chemistry by faculty of the University of Maryland College Park, Department of Chemistry and Biochemistry, and from mentors Dr. Joseph Houck (chemistry professor, Penn State University, PA), Mrs. Esther Hines (chemistry teacher, Billerica Memorial High School, MA) and Dr. Laura Serbulea (chemistry professor, University of Virginia, VA). This year two peer mentors: Mr. Anugrah Chemparathy and Mr. Edward Jin, (both students at MIT, MA) assisted the mentors in training the students. This year all lectures, problem solving sessions and office hours as well as social activities were held virtually. Students participated in guest lectures given by: Dr. Joshua Pak (Idaho State University, ID), Dr. Lauren Zarzar (Penn State University, PA), Drs. Katherine Lee and Steve Wright (Pfizer, MA), Dr. Rigoberto Hernandez (Johns Hopkins University, MD), Dr. Angela Zhou from CAS, OH), Dr. Robert Langer (MIT, MA), Dr. Ozvaldo Gutierrez (University of Maryland College Park, MD), Dr. Isiah Warner (Louisiana State University, LA) and participated in the “virtual tour” and panel discussion with of Ms. Leah Kauffman, Dr. Melissa Phillips, Dr. Lee Yu, and Dr. Amanda Moors (NIST, DC).

Dr. H.N. Cheng, 2021 ACS President was a keynote speaker at the virtual banquet for the students and invited guests. At the conclusion of the camp, the members of the U.S. team and two alternates were selected. The 2021 alternates were: Ne Dassanayake- Ames High School, IA, (Ames Local Section) and Nathan Ouyang, University High School, CA (Orange County Local Section).

The 53rd IChO was organized virtually and hosted from Osaka, Japan, between July 25 and August 2, 2021. Team USA students and mentors traveled to Washington DC where they participated in IChO activities. For most of the competition students and mentors followed separate schedules to ensure the fairness and security of the competition. Students were
chaperoned by the following ACS staff: Mr. David Horwitz, Mr. Kelley Love and Ms. Malgorzata Thatcher. IChO organized prepared a virtual platform where students engaged in various activities including virtual tours of chemical facilities, video presentations, and had an opportunity to meet and talk to other participants from other countries. Students took the five hour IChO exam at the ACS headquarters proctored by ACS staff member Dr. Alvin Collins on July 28th. Exam translation, grading and arbitration was done virtually by the USNCO 2021 mentor team. After the exam students had an opportunity to visit several Washington D.C. museums and landmarks, went hiking in the Great Falls National Park in Maryland, and took a scenic night tour of the capital’s monuments. Each of the Team USA member had also an opportunity to meet virtually with staff of the senators and representatives from their home states, who congratulated students on their achievements. Team USA students, mentors and ACS staff watched the virtual closing ceremony on August 2nd when the results of the 53rd IChO were announced.

The American Chemical Society views the USNCO program as an investment in the future of young chemists in this country. The goals of the program are to:

- **stimulate young people to achieve excellence in chemistry**;

- **recognize outstanding chemistry students and, by doing so, encourage additional learning at a formative time in their intellectual development**;

- **recognize the excellent achievement of the teachers of these students and the importance of the school environment in which they learn**;

- **promote contact between ACS local sections and area schools and foster the interest and influence of professional chemists in the teaching of chemistry**;

- **challenge the chemical knowledge and skills of young students in an international arena**; and,

- **foster cross-cultural experiences and acquaint students with similarities and differences between themselves and their counterparts in other nations**.

Since 1984, the USNCO program has been sponsored by the Donald F. and Mildred Topp Othmer Chemistry Olympiad Endowment.

The following corporations and donors supported the program through financial support and in-kind donations

- **Macmillan Learning**  
  Analytical and organic chemistry textbooks

- **Pearson Education Company**  
  Physical and inorganic chemistry textbooks

- **Texas Instruments Inc.**  
  Scientific calculators
• **Individual private donors**

The ACS USNCO staff appreciates the dedication, enthusiasm, and contribution of time given by:

- The 2021 members of the USNCO Subgroup of the Society Committee on Education, which provided policy direction for this program,
- The members of the USNCO examinations task forces, the grading team, and the mentor selection task force,
- The faculty of the Department of Chemistry and Biochemistry of UMD College Park, and
- The mentors and peer mentors who taught and guided the 2021 Alpha Xi Team.

Thank you!
“Outsmart your brain: What resilience looks like this year” (November 19, 2021): Dr. Lindsay Bira presented ways to help cope with stress and anxiety, juggle classes, research, personal responsibilities, and students’ own well-being when “normal” keeps changing. Registrants: 107

Fall Virtual Meeting (2021): The third virtual meeting program, second Fall virtual program, focused on promotion of joint programming such as the Chem IDP workshop: Planning for your Career as well as promoting other virtual events for the fall. The Graduate School Fair and undergraduate student poster session were hosted on the Remo platform which was a successful method for student engagement. Eighty-six posters from undergraduate students and Project SEED students were presented. Over 250 people (both poster presenters and attendees) registered for the poster session; over 80% of registrants attended the event. The virtual Graduate School Fair had 57 institutions and programs that students could interact with. About 400 people registered for the Graduate School Fair (number includes students and grad school representatives) with just under 300 attending the event.

Grad School workshops (5): A suite of programming is mostly developed and now is in the refinement process. It follows student questions/needs throughout the academic year as they apply to graduate school: September “Don’t Panic: Getting Into Graduate School” and December “The Graduate School Decision: What’s Right for You?” had a panel of faculty from graduate programs and graduate students. April “Behind the Scenes, Graduate School Edition” and January “I applied to grad school now what?” had a number of faculty and graduate students on hand to discuss issues with students and answer questions. All four had Sam Paczini presenting and Michelle Boucher moderating. These are webinars with interactive Q&A in chat and in Q&A windows. Typical attendance has stabilized around 75 participants, although the summer workshops often see as many as 150. Many of these are archived online and rotated as the academic year cycles. Another workshop in this set is planned for April, as well as an upcoming international graduate school workshop.

“Graduate School Reality Check” was again modified and presented virtually in January 2022 as part of the Graduate School Readiness and Professional Development Boot Camp for the ACS Bridge Program.

Networking collaboration with YCC/SCC: USAB again took part in the collaboration with YCC/SCC with their virtual Ice-Cream Social event in September. Students were able to rotate among breakout sessions geared towards industry, academia, government positions, and other areas of interest. There were 89 undergraduate and graduate participants and a great deal of positive feedback. The Ice-Cream
Social will be in-person for the Spring National Meeting, but there is the potential for virtual meetings moving forward.

**Graduate School Fair:** Students will have the opportunity to speak with representatives from a number of colleges and universities across the United States to learn about their graduate school programs in the chemical sciences. As of February 24th, 19 recruiters have registered.

In addition, a **Virtual Graduate School Fair** will take place on Tuesday, April 5, 2022 from 1:00 - 3:30 pm through Remo.

**US visas for international students (October 7, 2021):** Brian Getson gave a webinar for international chemistry and chemical engineering students who are planning to study in the United States as undergraduate or graduate students, professionals seeking a career in the US, whether in academia, industry, or government. The issues and procedures for obtaining student visas, work authorization based on student visas, post-graduation work visas, and the various methods of applying for a green card were discussed.

**Making chem demo videos (3):** Three workshops on creating great chemistry demonstration videos were developed. “Getting started” in November focused on scripting-writing and other pre-production concerns; it was presented by Helen Thompson of Science News. “Capturing your chemistry” in January covered the technical aspects of filming chem demos and was presented by Stephanie Castillo of Phuture Doctors. “From footage to video” in February covered the basics of video editing. Each workshop had over 100 attendees, half of which were from outside of the Chem Demo Filming Cohort (see below).

**Chem Demo Filming Cohort:** 27 ACS student chapters, international student chapters, and graduate student organizations were assembled to create videos for the Chemistry Engagement Library. (The Chemistry Engagement Library is a collaborative project with ACS Outreach to develop a suite of activities, videos, and other resources to support volunteers in engaging the public in chemistry.) Each group received filming supplies and a small amount of funding to develop a video around an assigned activity. They also participated in the “Making chem demo videos” workshops (above) and office hours with the facilitators. Their work is being reviewed for safety, efficacy, and engagement throughout development. The final videos are due at the end of March 2022.

**Student program, ACS 2022 Spring Meeting:** Both in-person and virtual programming is planned for the spring student program. The in-person program will feature Raychelle Burks, American University, as the Eminent Scientist, and sessions on chemistry in the media and diversity in the chemistry profession will be held. The in-person program will also include graduate school preparation workshops, the graduate school fair, a networking workshop, the undergraduate research poster session, and receptions for the ACS student chapter award winners and the graduate students and postdocs. Virtual sessions will include the student chapter award ceremony, a virtual graduate school fair, and a virtual poster session.

**DEIR Grant:** With funding from the ACS Board of Directors, a grant focused on diversity, equity, inclusion, and respect was introduced in 2021. To date, 23 proposals have been awarded.
Engagement Grant: With funding from the ACS Board of Directors, a grant focused on student chapter development and engagement was introduced in 2021. To date, 53 proposals have been awarded.

Professional Meeting Grant: A new variation of the national meeting grant was introduced in 2022. This grant supports travel to scientific meetings, including ACS meetings, as well as hosting meetings, both in-person and virtually. So far 72 proposals have been funded.

Student Chapter Awards: The report was modified this year to include a question that asked student chapters to share how the pandemic strengthened their chapter and what practices/events they plan to keep. There were 49 Outstanding, 74 Commendable, 87 Honorable Mention, and 27 Green (International and Domestic Chapters both) awards. Plaques were shipped to the award winners. A virtual ceremony is planned for the Spring, plus an in-person reception at the ACS Spring 2022 Meeting.

inChemistry: The digital magazine is now an exclusive ACS member benefit; with the exception of very recent articles and a few commonly referenced by other sources, articles are now accessible only to those with premium or standard memberships. Popular articles include “How To Survive Your Organic Chemistry Class,” “Know Your Techniques: Nuclear Magnetic Resonance (NMR) Spectroscopy,” “The Real Cost of Grad School in the US” (in partnership with C&EN), “Finding Your Path as a Chemical Technical Professional,” “Finding Your Path as a Chemical Technical Professional,” and “Presenting Your Best Self on Social Media.” USAB serves as a resource to the publication. USAB membership provides article ideas, article authorship, and advice for these articles.

Graduate Student Organizations (GSOs): As the GSO program starts year two, there are ten institutions who have chartered with ACS. This new program creates a pipeline for undergraduate students to move on from their student chapters and start or join an ACS GSO in graduate school. Similar to the student chapter program, GSOs provide the opportunity for financial support through grants, access to professional/career development, and a global community/engagement with chemistry graduate student peers.

Pacifichem: USAB was invited to offer a panel showcasing non-traditional careers in chemistry at Pacifichem. Students learned about careers spanning chemical start-ups through health policy and locations around the globe. 114 students registered and 58 attended, with almost no attrition during the webinar. The responses from students were positive and the questions and conversations highlighted the need for further programming dealing with alternative postgraduate paths beyond graduate school.
Inaugural Student Chapter Summit for India: Together with the office of Scientific Outreach, we hosted an online summit for student chapters in India from 15-19 November 2021. There are 18 chapters in India, and we had representation from 11 of them. The event included pre-work in ACS’ learning management system and featured group work, presentations by ACS staff about running a successful chapter, chapter troubleshooting, and hosting a chemistry festival, among other topics. The event was met with positive feedback, receiving high marks in the post-event survey. Participants voiced the desire to continue to meet in such a manner, and the ability to hold this event virtually served as an excellent pilot for future iterations in which sending ACS staff may be cost-prohibitive. The event fostered good will and also featured the input and expertise of our ACSI staff in India.

STUCOMM Collaborations with ACS On Campus: Two presentations were made by our team in tandem with events hosted by ACS On Campus. The first, a short presentation at an ACS On Campus event with CLAQ in October 2021. This was followed by a presentation to a prospective chapter at the Benemérita Universidad Autónoma de Puebla (BUAP) in Mexico, which resulted in 7 new student memberships. A new chapter charter for this school is nearly complete. Finally, we also presented at an ACS On Campus French-language event for students in Tunisia and North Africa.

Furman University Virtual Activities: STUCOMM team members will join Furman University for a virtual event on March 26, which will welcome faculty and students from area chemistry departments for an event during which we will share ACS resources, the benefit of starting an ACS student chapter, the benefits of ACS membership, as well as allow time for faculty members to discover tips for running a chapter from a faculty perspective. We expect enrollment of about 20 students and faculty at this event.

Social media engagement: The @acsundergrad presence on Instagram, Twitter, TikTok, and Facebook continues to grow followers. Engagement remains steady and above the industry standard most months. The grad & postdoc presence on Facebook, LinkedIn, and Twitter shows continued engagement. In 2022, we are posting the #TourofChem that explores a different field of chemistry each month. January promoted organic chemistry and February is chemical engineering. Over the next couple of months, we’ll share about biochemistry and green chemistry.

During the ACS Spring 2022 Meeting we are planning to have student chapters takeover the Instagram account for a part of each day of the program.

Respectfully submitted:

Michelle Boucher, Chair USAB
Nicole Di Fabio, Staff Liaison
Meeting Participants:

**GSPSAB Members:** Judy Kim (Chair), Sam Pazicni (Vice-Chair), Carmen Gauthier, Philippe Buhlman, Nicole Kaufman, Joerg Schlatterer (ACS liaison),

**Guests:** Steve Corcelli, Miranda Gallagher (Recent Postdoc), Jenna Tashiro (Postdoc), Silvina Di Pietro (Postdoc), Nancy Bakowski, (ACS), Nicole DiFabio (ACS), Leslie Reynoso (ACS), Milcah Jackson (ACS), Zebib Gebretensae (ACS), Ruth Tessema (ACS), Leah Martinez (ACS), Christian Schiavone (CAS)

**Inclusion Moment:** The GSPSAB inclusion moment consisted of two parts. First, to recognize and celebrate the diversity of all meeting participants, every person on the call was asked to unmute and share their professional identity and another part of their identity by saying “I am a chemist and...”. Second, the link to an Inclusive Language Guide that was developed at the University of Washington in collaboration with the Disabilities, Opportunities, Internetworking, and Technology (Do-It) Center was shared with all participants.

**Updates from the Chair**

- The next GSPSAB meeting is will be held in person during the ACS Spring National Meeting in San Diego on Monday, March 21 (8-11:15 am PT).
- The graduate student and postdoctoral researcher recognition project was approved by SOCED and CPT. The ACS Student and Postdoctoral Scholars Development (SPSD) Office will work on the implementation of this project to recognize the outstanding achievements of graduate students and postdoctoral researchers in areas such as Diversity, Equity, Inclusion, and Respect, research safety, and mentoring this spring.
- The coordinator position for the Graduate Student Symposium Planning Committee is still vacant. A reminder to GSSPC representatives will be sent shortly.

**Updates from the ACS Student and Postdoctoral Scholars Development (SPSD) Office**

- The name of the ACS Student and Postdoctoral Scholars Office changed to ACS Student and Postdoctoral Scholars Development (SPSD) Office. With this change the office portfolio includes the undergraduate student member hub InChemistry.
- ChemIDP will launch a Master CV feature in early February.
- The student application portal of the ACS Bridge Program is open until March 31, 2022. GSPSAB meeting participants can share this ACS LinkedIn post with their communities

**Community Updates:**

- No updates provided.
Discussion 1: Establishment and growth of ACS Graduate Student Organizations (GSOs)

Nicole DiFabio (Senior Manager, ACS Student Communities) provided background information for ACS Graduate Student Organizations (GSOs). ACS GSOs started in 2020. Currently, ten GSO’s have been charted over the last two years. Postdoctoral scholars can join and contribute to GSOs. Following focus questions were discussed in breakout groups. Discussion highlights are listed below each question.

1. What are possible barriers for chartering a GSO? What is needed to overcome these barriers? Is there anything ACS could do to help overcome such barriers?
   • Some institutions have already graduate student organizations
   • Time commitment to contribute as a student/postdoc to GSOs
   • The role of advisor is too narrowly defined
   • The name GSO excludes postdoctoral researchers
   • Limited awareness of the possibility to start an ACS GSO among graduate students and postdocs
   • Advisors might be discouraged to serve in this role if there is not a co-advisor

2. What is the value proposition for grad students to invest time in a GSO?
   • Students and postdocs can get leadership experience
   • Access to funding for community activities
   • Students and postdocs can engage more in departmental advocacy and transformation
   • Engagement of GSO leaders at ACS meetings

3. How can GSO work synergistically with the YCC, Local Sections, and Local Section YCCs?
   • Increased networking opportunities
   • Resources can be shared
   • Collaborations for receiving funding and organizing events
   • Support with logistics

Discussion 2: Lessons from remote learning in the grad ed/postdoc training space

Judy Kim (GSPSAB chair) introduced the topic prior to discussion of following questions. Discussion highlights are listed below each question.

1. As a graduate student and postdoc, what elements of remote learning/research/teaching were positive? (Possible considerations: research productivity, access to resources, safety, mentoring, communication, teaching, career planning, networking, outreach...)
   • Syllabi become more inclusive
   • Labs become greener
   • Asynchronous work became possible
   • Increase access to seminars and research presentations
   • Collaborative projects became even more doable
   • Networking and mentoring with existing connections became easier
   • Use of instant messaging and e-teaching became more popular

2. What elements of remote learning/research/teaching were negative?
   • Networking and the development of networking relationships with new individuals was difficult
   • Feeling of being disconnected from peers
   • Restricted access to campus resources
   • Increased financial burden
   • Transitioning from in-person learning to remote learning
3. What elements about remote education and training should be retained as we move forward?
   - Recording of classes and accessibility of learning module content
   - Conferences and meetings should be offered in a hybrid format
   - Virtual office hours

GSPSAB Recommendation(s):

- ACS Graduate Student Organizations (GSOs):
  - Consider making organization name more inclusive to encourage postdoctoral researchers to engage in activities.
  - Consider more flexibility for the advisor role (e.g., allow co-advising and consider administrators, non-tenure track faculty, and postdocs as possible advisors).
  - Identify existing graduate student organizations and communicate the value of becoming an ACS GSO (e.g., access to resources, network, and recognition).
  - Consider convening GSO leaders at ACS meetings.

- Promote the use of hybrid event formats.
Summary of Agenda Book Materials: March 18 Full Committee/Subcommittee Meeting

1. Meeting Notes from Fall 2021 and Feb 22, 2022, Subcommittee Meetings (for reference)
2. 2019-03 Science Education Policy Statement (for reference)
3. Proposed Science Education Policy Statement Draft (for discussion)
4. ACS GA Report to SOCED: Science Education & Workforce Update (for reference)
   a. ACS House USICA/COMPETES Letter 2022
   b. STEM Ecosystems Press Release 2022
   c. OSTP Coalition Letter FY23

Subcommittee Charge:

Chaired by a member or associate of SOCED. Comprised of members, associates, and consultants of SOCED. Chairs of the subgroups associated with this subcommittee will also serve as members and serve as the representative for their subgroup. A member(s) of this subcommittee will serve as science policy writing team leads or contributors, on behalf of SOCED, as requested by the Committee on Public Affairs and Public Relations.

- Recommends public policy statement updates to SOCED in preparation for recommending to the ACS Board of Directors every third year on issues including science education, federal funding for scientific research and education, and visas (related to education and scientific exchange).

- Identifies policy needs through research and collaboration both internally and, when appropriate, with external partners to ensure that SOCED is able to lead the conversation on improvements to and investments in our nation’s education systems.

- Communicates the value of a member driven public policy statement process and its role in the Society’s advocacy for the chemistry enterprise, through webinars, workshops, and other tools. Supports ACS public policy priorities by developing advocacy awareness through participating in advocacy workshops and messaging campaigns in collaboration with the ACS Office of External Affairs and the Committee on Public Affairs and Public Relations.

- Ensures the Society’s core values are reflected in the development, management, and implementation of ACS science education policies.

- Oversees the appointment process to build diverse and inclusive subgroups that connect stakeholders with unique perspectives and expertise while ensuring that the subgroups provide reports of their activities on a regular basis.
SOCED Science Ed Policy Subcommittee

Summary of Fall 2021 Working Group Meetings

**Purpose:** Fall Meetings: Each working group met to discuss edits and revisions to their section of the science education statement.

I. Merging the Hands On Science and Evolution statements into the STEM education statement
   a.) *Evolution Statement Working Group:* Jesse Bernstein & Pamela Leggett Robinson (worked through e-mail)
   b.) *Hands on Science Statement Working Group:* Susan Shih & MaryKay Orgill (worked through e-mail)
   c.) *Timeline:* Group began reviewing/comparing statements in early August, comments & revisions finalized in early September
      • Run through changes in statement in 2019 that allowed for absorption of Hands On Science and Teaching of Evolution
      • Need for more explicit language on hands-on science with the emerging issues of virtual and hybrid teaching and learning during COVID19 and beyond.

II. Diversity, Equity, Inclusion, and Respect
   a.) *Working Group:* Jesse Bernstein, Pamela Leggett Robinson, MaryKay Orgill, Susan Shih & Laura Pence
   b.) *Timeline:* Monday, September 13, 11:00am-12:00pm, virtual
      • Directive from PA&PR to strongly address DEI&R in this statement
      • Strengthened language and placement for emphasis.
      • “Historically and presently marginalized” instead of “underrepresented”, “underserved” can be used to reference rural communities that are not racially or ethically diverse.

III. Emerging Trends
   a.) *Working Group:* Danae Quirk Dorr, Dorian Canalamas, Cheryl Frech, Jennifer Nielson & Laura Pence
   b.) *Timeline:* Wednesday, September 15, 3:00pm-4:00pm, virtual
      • Context of the past year of virtual teaching and learning- broadband availability? Flexibility in certain areas such as standards? Hands on labs? Other issues that are policy-focused?
      • Emerging technologies or practices
      • Focus on supplement not supplant, increasing support for broadband and connectivity, physical lab access and considerations for physical, emotional, and invisible disabilities.
Summary of February 22, 2022, Full Subcommittee Meeting

Purpose: Welcome new subcommittee members. Review working group edits to Science Education policy statement, prepare comprehensive draft for submission to full committee in March. Review/refresh timeline. Discuss academic integrity concerns.

Attendees (All Virtual): Laura Pence (Chair), Jesse Bernstein, Stacey Lowery Bretz, Brent Eldridge, Cheryl Frech, MaryKay Orgill, Danae Quirk, Steven Trohalaki, Lauren Posey (Staff), Jodi Wesemann (Staff).

I. Welcoming Stacey Lowery Bretz, Brent Eldridge, and Steven Trohalaki!

II. Statement Working group edits discussion:

a. Diversity, Equity, Inclusion, and Respect
• Further discussion around use of “historically and presently marginalized” and “underserved/underrepresented”. Broad agreement from the committee that the use of “historically marginalized” helps to clarify the goal of righting the wrongs, addressing the actions of the marginalizing community and it impacts on those who were and are marginalized.
• Further discussion is required internally at ACS in light of the ACS Style Guide for inclusivity and use of terms not approved or encouraged. Is there a difference between ACS press material and ACS policy statements where specific language is needed to reinforce the emphasis the committee and the board want to place on equity?

b. Emerging Trends & hands on science
• Academic integrity was mentioned here, online learning tools, ease of sharing, cheating etc.
• Need to strength hands on language to ensure virtual learning isn’t the new norm. Physical science is more expensive to teach, want to hedge movements by states or institutions to drop requirement for hands on/ in person experiences.

c. General Discussion
• “Informal/Formal Ed, does this need to be present in the teacher education bullet? Is there a more appropriate place?” “Agree that “informal” needs to be in this document somewhere. This strengthens our support of things like museum education programs, which are an excellent way to provide information and experiences to the public.”
• Research experiences “Support summer and academic-year research experiences for undergraduates that (1) encourage meaningful science learning and (2) promote diversity, equity, and inclusion in STEM fields.”
• Final/Closing paragraph, is this needed? Cheryl & MaryKay say no, Brent says yes. Warrants further discussion after edits are made.
• All efforts will be made to keep statement to two pages.

III. Review/Refresh statement timeline:
  • February 25: Draft statement into SOCED agenda book
  • March 18: Full committee discusses current draft
  • Early April: Comments due back from full SOCED committee. Revise draft
  • Early May: Comments due back from external groups (Diversity Advisory Board, for example.) Revise draft
  • Early June: Draft statement to staff for editing, formatting, internal vetting.
  • July: Final draft due for SOCED agenda book
  • August: SOCED votes in final draft
  • December: ACS Board of Directors votes on approval of new statement

IV. Academic Integrity
  • The Subcommittee was joined by Assistant Staff Liaison to SOCED, Jodi Wesemann to facilitate conversation. Gave background on materials from the Committee on Ethics, Global Chemists Code of Conduct, Exams Institute.
  • What is SOCED’s role?
  • Notes from the conversation:
    - Institutions are allowing cheating through lack of control of IP etc.
    - Efforts should be made to reduce opportunities to cheat, communication and messaging to make educators and institutions aware of the extent of the issues.
    - Instances of direct plagiarism in lab reports
    - Need for controlled environment for assessment
    - Lab kits create many issues including safety, cheating, inability to correct or provide live feedback for all students, inability to note progression through the lab for each student via snaps/live streams.
    - Too much of the pressure or onus is on the professor/educator
    - Questions of surveillance, how much is too much, what is the line. Creates a complicated and fluid situation.
SCIENCE EDUCATION POLICY

Well-educated scientists and engineers drive innovations that allow the United States to maintain its competitive edge in the global marketplace and improve the well-being of citizens worldwide. Science, including chemistry, is central to how people address problems at local, regional, national, and global levels. Preparing current and future students with the skills necessary to address rapidly evolving challenges requires investment at all levels of STEM (science, technology, engineering, and mathematics) education. It is vital that every student attains an appropriate level of science understanding to be prepared for current and future challenges and opportunities.

To achieve a robust and sustained pipeline of STEM talent, policymakers should pursue the following three objectives:

1. Promote lifelong, rigorous education of science concepts and practices in formal and informal settings to improve citizens’ understanding of science and its role in society.
2. Provide adequate state and federal support for science education, as well as pre- and in-service teacher preparation and continuing education, to strengthen the quality of teaching which will enhance student learning.
3. Encourage students of all backgrounds, particularly those from underrepresented groups, in the pursuit of education and careers in STEM fields.

To work towards these objectives, investments must be made systematically to three fundamental areas of science education.

Science Education System

- Promote science literacy by ensuring that science is a core subject and taught at every level of education.
- Provide for the development of evidence-based methods and curricular materials for teaching chemistry.
- Support the use of curricula that emphasize interdisciplinary aspects of chemistry, and the role of science in solving particular national and global challenges.
- Ensure that standards of learning are rigorous and broadly applicable.
- Encourage the expectation that all students have the opportunity to develop career appropriate STEM competencies.
- Ensure that facilities, including scientific information and library resources, support quality education by being well equipped, accessible, and up-to-date.
- Endorse hands-on laboratory science experiences that develop specific skills and recognize that computer-simulated activities are not equivalent replacements.
- Ensure federal, state, and local resources are equitably distributed to traditionally underserved and underrepresented communities.

The American Chemical Society (ACS) Board of Directors Committee on Public Affairs and Public Relations adopted this statement on behalf of the Society at the recommendation of the Society Committee on Education. ACS is a non-profit scientific and educational organization, chartered by Congress, with more than 158,000 chemical scientists and engineers as members. The world's largest scientific society, ACS advances the chemical enterprise, increases public awareness of chemistry, and brings its expertise to state and national matters.
• Foster a positive safety culture in laboratories by requiring a robust education in chemical health and safety.
• Support the development and implementation of green and sustainable chemical concepts at all levels of chemistry instruction.
• Create effective, alternative pathways for second-career opportunities in the chemistry enterprise.

**K-12 Science Education**

• Recruit, retain, value, and reward a diverse community of teachers who are well prepared in their science and education backgrounds, and offer them lifelong professional development opportunities to improve their content knowledge and pedagogical skills.
• Strengthen existing STEM teacher education programs by emphasizing the use of evidence-based methods and encouraging increased and up-to-date science content knowledge.
• Require science educators to obtain necessary safety training to facilitate learning in the laboratory and to conduct chemical demonstrations.
• Include current teachers as full participants in the design of programs for professional and curricula development.
• Improve coordination of formal and informal learning opportunities between teacher education programs and STEM departments at higher education institutions.
• Encourage interactions and partnerships between schools, teachers, students and STEM industries, businesses and professionals in order to provide experiential learning, enhanced teaching opportunities and appropriate role models.

**Higher Education**

• Incentivize efforts that improve the capability of higher education institutions to recruit and retain students, especially those from underrepresented groups, into the STEM fields.
• Promote coordination of programs between two-and four-year institutions to provide students who enter education at a variety of institutions with options for pursuing STEM degrees.
• Expand undergraduate research experiences by supporting summer and academic-year research projects and collaborations with industry, other academic institutions, government labs, and international partners.
• Invest in, promote, and reward educational research in STEM subjects that guide the development and evaluation of model programs, tools, and methods for improving the teaching and learning of science.
• Support the use of research-based practices for teaching undergraduate and graduate students, including the expectation that faculty are educated in these practices.
• Require institutions to provide comprehensive safety training and protocols in both teaching and research laboratories.

By meeting these objectives, the United States will have a continuously refreshed pool of educated students, informed citizens, and a prepared workforce ready to address challenges and opportunities.
SCIENCE EDUCATION POLICY

Science literacy and expertise are essential to the function of modern society. Both learners and global citizens need to understand the concepts and processes of science, including chemistry, to make sense of and address the complex challenges they encounter every day. Scientists and engineers who have diverse abilities, experiences, and backgrounds drive an innovative economy and improve the well-being of all global citizens. Preparing current and future learners with scientific knowledge and skills to contribute to society and to address global health, environmental and economic challenges requires investment at all levels of STEM (science, technology, engineering, and mathematics) education.

Policymakers should pursue the following three objectives:

1. Promote meaningful lifelong education of science concepts and practices to improve citizens’ understanding of science and its role in society.

2. Ensure equity of access to high quality education and careers in STEM fields for students of all backgrounds, particularly those from historically and presently marginalized populations.

3. Provide robust state and federal support for both science education and lifelong science teacher education.

To work towards these objectives, investments must be made systematically to three fundamental areas of science education.

U.S. Education System

- Promote science literacy by ensuring that science is taught as a core subject, students are given opportunities to engage in hands-on laboratory experiences, and that standards of learning are meaningful and broadly applicable.

- Ensure federal, state, and local resources are equitably distributed, with particular concern for underserved and marginalized communities.

- Provide for the development of evidence-based methods and curricular materials that emphasize the connections between chemistry and other disciplines.

- Promote the expectation that all students develop career-appropriate STEM competencies and provide opportunities for alternative second-career pathways in science.

- Require hands-on laboratory experiences that are accessible to students of all abilities, advance the learning of science, develop students’ problem-solving and critical thinking skills, and inspire prepared students to pursue STEM careers. Recognize that although web-based and computer-simulated activities serve as valuable supplements and temporary alternatives when in-person learning is not possible, these substitutes are not equivalent nor suitable as long-term replacements.

- Ensure that facilities - including laboratory equipment, instrumentation, scientific information, library resources, and broadband access - are universally accessible, flexible and up-to-date.
Promote a positive safety culture in laboratories by requiring a robust education in chemical health and safety.

Support the development and implementation of green and sustainable practices at all levels of chemistry instruction.

**K-12 Science Education**

- Recruit, retain, value, and reward a diverse and well-prepared community of teachers and offer lifelong professional development opportunities to improve content knowledge and pedagogical skills.
- Strengthen existing STEM teacher education programs by emphasizing the use of evidence-based methods and encouraging increased and up-to-date science content knowledge.
- Engage teachers as full participants in the design of programs for professional and curriculum development and include resources for a variety of learning environments.
- Require science educators to obtain comprehensive safety training to foster safe environments in the laboratory and when conducting chemical demonstrations.
- Promote both formal and informal learning opportunities to provide access to STEM experiences.
- Support partnerships between schools, teachers, students and STEM industries, businesses, and professionals to provide experiential learning, enhanced teaching opportunities and mentorship.

**Higher Education**

- Improve the capability of higher education institutions to recruit and retain diverse students, especially those from underserved and marginalized groups.
- Expand undergraduate research experiences and strengthen diversity, equity, and inclusion by supporting summer and academic-year research projects and collaborations with education stakeholders.
- Invest in educational research in STEM subjects that guide the development and evaluation of model programs, tools, and methods for improving the teaching and learning.
- Support the use of research-based practices for teaching undergraduate and graduate students, including the expectation that faculty are educated in these practices.
- Promote the coordination of programs between two- and four-year institutions to provide students a variety of options for pursuing STEM degrees.
- Require institutions to provide comprehensive safety training and protocols in both teaching and research laboratories.

A scientifically literate public and science workforce representing the full diverse spectrum of our population will be poised to address global health and environmental challenges as well as drive economic growth through innovation.
Science Education Policy (2019-03)

Congress looks towards Innovation and Competitiveness Legislative Conference

ACS has endorsed several legislative targets that are included in both the Senate USICA and House COMPETES bills, seeking greater equity, access and investment in the higher education and STEM research. The ACS endorsed STEM Opportunities Act, Rural STEM Education Research Act, MSI STEM Achievement Act have been included in the House COMPETES draft. The ACS endorsed Research Investment to Spark the Economy (RISE) Act was included in the Senate USICA draft and both bills included the ACS endorsed Supporting Early Career Researchers Act and the Combating Sexual Harassment in Science Act. ACS praised the transparent and bipartisan work of the House Science Committee for their work to pass the NSF/DOE For the Future Acts, included in the House COMPETES bills and have launched an ongoing member advocacy alert to engage members with their congressional delegations to advance the ACS priorities in both bills as they work through the conference process. [See Page A]

ACS Endorses the Strengthening STEM Ecosystems Act

ACS endorsed the bipartisan Strengthening STEM Ecosystems Act, co-sponsored by Sen. Mark Kelly (D-AZ) and Sen. Jerry Moran (R-KS) introduced on February 10, 2022. The bill would establish a grant program within the National Science Foundation (NSF) to help facilitate partnerships between communities, schools, and governments to scale best practices in STEM teaching and learning and create accessible, and inclusive STEM learning. ACS Board Chair and constituent, Paul Jagodzinski, was quoted in Senator Kelly’s press release praising the bipartisan leadership of the innovative legislative proposal. [See page B]

Office of Science and Technology Policy (OSTP): STEM VISA Discussion

On January 20, ACS was invited to participate in the White House National Security Council and OSTP hosted discussion on STEM talent attraction and retention with Special Assistant to the President and NSC Senior Director Tarun Chhabra and Deputy Assistant to the President for Technology & National Security and OSTP Deputy Director Jason Matheny. ACS has collaborated with OSTP to ensure policies set forth by the agency are in line with ACS and science community priorities. In November, the ACS joined the STEM Education members in a letter calling on now former OSTP Director Eric Lander to prioritize equity and inclusion in STEM, STEM research support for Minority Serving Institutions (MSI), support early career scientists, encourage collaboration at federal agencies on STEM and to increase engagement with the STEM stakeholder community. [See page C]

Department of Education DEI STEM Roundtable

ACS and the board members of the STEM Education Coalition have worked with the Department of Education since November 2021 to identify stakeholders in the STEM community to participate in focus groups with the Department. In early January, the Secretary of Education Miguel Cardona announced a series of STEM Stakeholder Roundtables with U.S. Department of Education leadership, including Deputy Secretary Cindy Marten and Assistant Secretary Roberto Rodriguez. The ACS was invited to participate in the roundtable on Diversity, Equity and Inclusion in STEM, hosted on Feb 24th 2022. The ACS will continue to work closely with the Department as they work to prioritize equitable access for students and support for teaching and learning in STEM.
Science Education Congressional Briefings
Women Veterans and the STEM Workforce Briefing

On December 2nd, ACS Co-hosted “Strengthening the Pathway from Service to STEM: The Future of Women Veterans in STEM” congressional briefing, in partnership with the STEM Education Coalition. The Congressional Member and staff focused briefing featured speakers from the Education Development Center, U.S. Air Force, Northrop Grumman, and Universal Technical Institute to highlight the workforce skills overlap existing between many veterans and STEM careers.

Bipartisan Senate Women in STEM Caucus Inaugural Briefing

On February 16, the Bipartisan Senate Women in STEM Caucus hosted the inaugural Congressional briefing on Women in the STEM Workforce: COVID-19 Perspectives. The panel was included Sen. Jacky Rosen (D-NV), Sen. Shelley Moore Capito (R-WV) and representatives from professional societies, higher ed and industry to discuss ongoing challenges facing women in STEM, particularly during COVID. Policy topics explored were workforce training and professional development, workplace flexibility, and family-friendly policies. ACS serves as a stakeholder member of the Caucus.
January 25, 2022

The Honorable Nancy Pelosi
Speaker
United States House of Representatives
H-232, United States Capitol
Washington, DC 20515

Dear Speaker Pelosi:

As you work to shape a House companion bill to the United States Innovation and Competition Act (USICA), the American Chemical Society (ACS) urges you to consider the bipartisan and science & technology community supported initiatives outlined in the “For the Future” acts passed in 2021.

The ACS-endorsed National Science Foundation (NSF) for the Future Act is a forward-thinking vision for ensuring America’s global competitiveness in the 21st century. The creation of the Directorate for Science and Engineering Solutions recognizes the need to catalyze NSF’s existing science into translational research to address existing gaps in America’s innovation infrastructure. NSF For the Future acknowledges the critical need to broaden access to research opportunities, particularly in underserved and rural communities. Prioritizing safe, secure, and equitable research environments will help to enable a diverse and inclusive workforce to meet the demands of emerging technologies and innovation leadership on a global scale. Additionally, the legislation builds on the Sustainable Chemistry Research and Development Act by reauthorizing a sustainable chemistry program, which is in an important component ensuring future generations can access the life changing, positive contributions of chemistry while eliminating the harmful human and environmental impacts.

The Department of Energy (DOE) for the Future Act, also endorsed by the ACS, would create a long-term vision of the Office of Science to robustly meet the challenges of the 21st century. Sustained, predictable funding is key to scientists and engineers making long-term research plans. ACS endorsed language supporting inclusion of sustainable chemistry, which will help fully account for the lifecycle impact of newly developed chemistries, and authorization of a helium conservation program, which will help conserve irreplaceable helium, essential to a wide range of foundational research.

The “For the Future Acts” take a comprehensive approach to creating a diverse, inclusive, sustainable, and innovative engine for the United States. Increasing the participation of underrepresented groups in STEM fields is vital to meet economic and scientific challenges of the next several decades. If we are to see sustained, achievable growth in federal innovation, it is imperative there is bipartisan buy-in and stakeholder support from the science and technology community, represented in the “For the Future Acts”. We are encouraged by your focus on these critical policies and hope that you include the bipartisan and collaborative initiatives as you structure this transformative legislation.

Sincerely,

[Signature]

Anthony Pitagno
Senior Director

American Chemical Society
1155 Sixteenth Street, N.W. Washington, D.C. 20036  T (202) 872 4475  F (202) 872 6206  www.acs.org
Anthony Pitagno

CC:

The Honorable Eddie Bernice Johnson
The Honorable Frank Lucas
Kelly, Moran Introduce Bipartisan Bill to Strengthen STEM Ecosystems

Today, U.S. Senators Mark Kelly (D-AZ) and Jerry Moran (R-KS) introduced the Strengthening STEM Ecosystems Act, legislation to boost STEM workforce and job training. The bill would establish a grant program within the National Science Foundation to provide funding to science, technology, engineering, and math (STEM) ecosystems and their partners to better connect communities, share knowledge, and create pathways for students to enter STEM careers.

With jobs in the science, technology, engineering, and math (STEM) fields expected to grow dramatically in the next decade, Kelly’s bill will support existing initiatives and ensure STEM organizations are involved in workforce development, education, and economic planning. The bill’s proposed grant program would not only promote the exchange of knowledge and better connect communities to their STEM partners, it would help states avoid costly and unnecessary programmatic duplication.

“Our legislation creates paths for Arizonans to develop skills in STEM in and out of the classroom by supporting local initiatives that help students get the experience and training needed for jobs in growing technology fields,” said Senator Kelly, a former NASA astronaut. “Strong skills in science and technology are critical to preparing Arizonans for the many high-paying jobs of the future and ensuring that the United States maintains its competitive edge on the global stage.”

“Expanding STEM education opportunities is critical to bolstering America’s long-term competitiveness on the global stage,” said Senator Moran. “STEM ecosystems are effective at bringing together nonprofits, schools districts, businesses, museums, universities, and more to accomplish just that. I have been a longtime supporter of STEM education and am pleased to introduce this bill with Sen. Kelly to support new and existing STEM ecosystems and their efforts to better reach rural America.”

See additional statements of support for Kelly and Moran’s legislation below:

“Robust and impactful STEM programs are vital for the education of Arizona’s students and their future careers. I am grateful for Senator Kelly’s leadership on the bipartisan Strengthening STEM Ecosystems Act, which, when passed, will help communities across Arizona meet the educational needs of our students and help them thrive in the long term,” said State Superintendent of Public Instruction Kathy Hoffman.

“Over the next ten years, STEM occupations in Greater Phoenix will grow two times faster than all occupations in the region. A holistic approach incorporating STEM investment, collaborative research, and workforce development is critical to maintaining global competitiveness,” said Chris Camacho, President & CEO the Greater Phoenix Economic Council. “We support this legislation which establishes a grant program for community-driven STEM initiative coordination and delivery. By connecting communities and sharing information we can meet the rising
employer demand and talent requisite that is essential for sustained economic growth in Greater Phoenix.”

“The technology industry is the backbone of Arizona’s economy. Therefore, it’s critical we invest in STEM talent at every level, from early childhood education to workforce development programs,” said Steven G. Zylstra, President and CEO of the Arizona Technology Council and SciTech Institute. “The Council and Institute fully support the Strengthening STEM Ecosystems Act, as it will provide the necessary resources to expand critical programs and ensure we’re able to develop the next generation of Arizona’s technology workforce.”

“Arizona’s community colleges strongly support STEM education for our students and communities, especially when aligned with workforce needs, and welcome the opportunity to expand our partnerships to include the STEM ecosystems that would be created by this legislation through a National Science Foundation (NSF) grant program,” said Chris Bustamante, Ed.D., Executive Director, Arizona Community College Coordinating Council (AC4).

“The American Chemical Society (ACS) is honored to endorse the bipartisan STEM Ecosystems Act, led by Sen. Mark Kelly (D-AZ) and Sen Jerry Moran (R-KS). ACS has long championed investments in responsive and equitable STEM Education programs,” said Paul Jagodzinski, Chair of the Board, American Chemical Society & Professor of Chemistry, Northern Arizona University. “This innovative legislation will help facilitate partnerships between communities, schools, and governments to scale best practices in STEM teaching and create accessible, and inclusive STEM learning. I am delighted by what this legislation could inspire right here in Arizona and across the nation as we work towards supporting our schools and future leaders.”

“Our nation’s future prosperity depends on excellence in science, technology, engineering, and mathematics and on making sure every single child in this country has a fair shot at excelling in these critical fields,” said James Brown, Executive Director, STEM Education Coalition. “Investing in the capacity of regional, state, and local community-based and STEM focused organizations that aspire to this goal is the foundation of a sustainable strategy to keep our country strong and competitive. The Strengthening STEM Ecosystems Act is a novel, bipartisan approach to meet this challenge.”

“This legislation will be a transformative investment to enable regional STEM ecosystems across the country to connect their business, education, and community organizations to collectively inspire and engage millions in STEM,” said Jeremy Babendure, Executive Director, SciTech Institute.

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For Immediate Release: February 10, 2022
November 19, 2021

The Honorable Dr. Eric S. Lander
Assistant to the President for Science and Technology
Director of the White House Office of Science and Technology Policy

Dear Dr. Lander:

Congratulations on your confirmation as Director of the Office of Science and Technology Policy and on the elevation of this role as a member of President Biden’s Cabinet.

The STEM Education Coalition is a nationwide alliance of nearly 1,000 business, professional, and education organizations that is devoted to promoting public policies that ensure that ALL students have a chance to learn the knowledge and skills necessary for success into today’s increasingly technological and globally competitive world. Our Coalition strongly believes that excellence in science, technology, engineering and mathematics (STEM) should be embraced as a bedrock element in conquering the challenges of today and tomorrow, including improving health, competing for the best jobs of the future, modernizing our infrastructure, protecting our environment and fostering equity for those who have been underserved by our systems.

To this end, we offer the following recommendations for advancing success and equity in STEM education as you formulate the Administration’s budget and policy priorities for the 2023 Fiscal Year and beyond:

**Working Toward Equal Opportunity in STEM Education for All Students is Job Number One:**

Equity is essential to STEM excellence, and for as long as inequities remain, both STEM and our country are disadvantaged. We must expand the capacity and diversity of the STEM workforce pipeline and prepare more students for the best jobs of the future by working to raise literacy and achievement in the STEM fields for all K-12 students – and beginning in the early grades both inside and outside the classroom. We must also invest in efforts to broaden participation in our higher education STEM ecosystem, for underrepresented students and faculty, to build a strong and equitable future. America’s global competitiveness and national security depend on a strong STEM research enterprise and workforce, as well as a STEM literate populace, both of which will be strengthened by broadening participation.
Reinstate the White House Science Fair:

President Biden’s personal leadership – and yours – will send the nation the message that excellence in the STEM subjects is a crucial national priority and that an equitable STEM education should be available to all students. Re-launch the White House Science and Engineering Fair and/or other similar events such as Maker Faires, Hour of Code, Future City Competition, and Astronomy Night.

Expand Collaborations Between Federal Agencies on STEM Best Practices:

In a similar manner to what is now occurring between private sector and community-based STEM organizations, OSTP can foster more robust sharing of best practices across federal agencies operating STEM programs for pre-K through workforce audiences. These efforts should parallel those for cybersecurity, nanotechnology, cloud computing and other similar intergovernmental efforts to harmonize and share best practices. OSTP should also expand the resources and staffing available to support the interagency Committee on STEM Education.

Expand Investments in STEM Capacity at Minority Serving Institutions:

We appreciate Administration efforts to expand federal resources that would bolster the capacity of Hispanic Serving Institutions, Historically Black Colleges and Universities, Tribal Colleges and other forms of Minority Serving Institutions to better serve students with STEM career aspirations and potential for success. We strongly support and encourage the Administration to continue and expand systematic efforts to invest scarce federal resources in the most efficient ways possible in STEM communities with the highest need.

Support High-Quality STEM Teaching and Teacher Education:

We support robust and sustained investments in preparing and retaining STEM educators, in elementary, secondary and informal settings. Systematically expand agency-by-agency federal efforts to expand the recruitment, training, and retention of a diverse body of STEM educators and administrators to leadership positions in STEM instruction. Additionally, while these efforts currently have some federal support at the K-12 level, it is also critical for postsecondary faculty to develop skills to improve learning and retention at the undergraduate level. Postsecondary STEM faculty play a crucial role in training pre-service STEM K12 teachers. Teachers are known to teach how they themselves were taught and thus it is essential that undergraduate STEM education reflect best teaching practices. The federal government should play a role in this area to drive incentives and to enable faculty to devote more attention to their teaching skills and professional development.
STEM Education is Not a Luxury, It is a Necessity: Science Should Be Included in the Federal Accountability System

Too many schools are turning away from a strong focus on the STEM subjects as they struggle to maintain basic operations during these challenging times. We need to reverse this trend before a generation of students falls behind in the knowledge and skills they will need to support our recovery, achieve equity, and propel us forward. One significant move on this front would be for the Administration to support including science assessments for federal accountability on par with assessments for Mathematics and English Language Arts in long terms plans to improve the Every Student Succeeds Act and other federal accountability rules. The Administration should also ensure that all STEM subjects continue to receive high-priority treatment in competitively awarded federal grant programs, as Science, Technology, Engineering, and Mathematics all offer students important STEM literacy skills in addition to best positioning the Nation for the future.

Prioritize STEM Workforce Innovations:

The Administration should support and amplify emerging public-private partnership models that are helping to grow the STEM workforce in targeted industry and populations. For example, “returnships” for women re-entering into STEM careers after an extended absence from a prior experience in the workforce are a growing corporate trend the federal government could apply directly and through incentives provided to more companies to adopt such policies. The Administration could also accelerate efforts to ease the transition of military veterans with specialized STEM skills into private sector areas with critical workforce shortages such as aviation maintenance, diesel mechanics, welders, and other skilled trades fields.

Support Early Career Scientists:

The impacts of the pandemic have compounded the numerous challenges that early-career scientists already face, including limited research funding and intense job competition. Early-career scientists, especially those from historically underrepresented backgrounds, have been hardest hit. According to the National Institutes of Health’s COVID-19 impact survey, students, postdoctoral fellows and early-career researchers were more likely to say the pandemic was causing negative impacts on their work and career trajectories than other groups. Almost 70% of trainees on visas reported lower job productivity, and 76% of trainees on visas reported that the pandemic will have a negative impact on their career trajectories. We strongly encourage the Administration to provide extra resources targeted at early-career scientists to ensure that they do not fall out of the STEM pipeline.
Research to Improve STEM Education at all Levels:

We need to invest in education research at the Department of Education and NSF to improve STEM education at the elementary, secondary, and postsecondary levels. Additionally, the federal government should increase support for the scaling of evidence-based innovations in education into classrooms.

Seek Robust Input from the STEM Community:

The STEM community is ready and willing to help inform federal efforts to improve programs, outreach, and messaging. The OSTP should continue to build upon previous efforts to seek out and engage with the STEM education community as it formulates policy decisions. This is essential as OSTP approaches the review and re-issuance of the next long term federal STEM strategic plan.

Fiscal Year 2023 Programmatic Budget Recommendations:

- We support the successful implementation of the *Every Student Succeeds Act (ESSA)* and its key STEM provisions:
  - *Student Support and Academic Enrichment Grants* (ESSA Title IV.A), which is the major STEM funding source for states and districts under ESSA.
  - *Education Innovation and Research* program (ESSA Title IV.F), which has awarded more than half of its competitive grants in the past year to support STEM-related projects.
  - *Supporting Effective Instruction Grants* (ESSA Title II.A), which funds professional development for STEM educators.
  - *21st Century Community Learning Centers* (ESSA Title IV.B), which funds high-quality STEM programming in afterschool and summer learning programs.

- We support funding for *The Strengthening Career and Technical Education for the 21st Century Act* (Perkins) which also has a significant STEM focus.

- We support the National Science Foundation’s *Education and Human Resources (EHR) Directorate*. The EHR directorate plays a critical role in expanding the STEM education knowledge base for broadened participation, graduate and undergraduate innovation and fellowships, enabling a skilled technical workforce, informal and afterschool education, and student experiences in STEM careers. NSF additionally funds student STEM training, education research, and community engagement in STEM through its
research directorates and initiatives such as the ADVANCE and INCLUDES programs. We support creating pathways for scaling and implementing NSF-funded education research through better partnerships with the Department of Education and look forward to seeing how EHR interacts with the new TIP Directorate. We encourage the new TIP Directorate to have a strong education and workforce agenda. Finally, the STEM ED Coalition supports the provisions in USICA and the NSF for the Future Act that would invest in STEM Education programs and research at NSF.

- We strongly support the *Minority Science and Engineering Improvement Program (MSEIP)* as a means for expanded targeted aid to bolster STEM capacity at Minority Serving Institutions.

We appreciate the opportunity to share our views on this vitally important topic. For further information please contact me at (202) 400-2192 or jfbrown@stemedcoalition.org.

Respectfully,

James Brown  
Executive Director  
STEM Education Coalition
TAB 11
ACS Ethics Resources – Academic Integrity

The following list of resources and excerpts from them focus on guidance regarding academic integrity. Most refer to general circumstances.

References to responsible conduct of research, which are more prevalent, are not included.

Ethical & Professional Guidelines

The Chemical Professional’s Code of Conduct

The American Chemical Society expects its members to adhere to the highest ethical and safety standards...

Excerpted from The Chemical Professional’s Code of Conduct

Chemical professionals should treat others with respect and will not engage in discrimination, harassment, bullying, dishonesty, fraud, misrepresentation, coercive manipulation, censorship, or other misconduct. Such actions apply to all professional, research, and learning environments, regardless of whether or not the action alters the content, veracity, or meaning of research findings, and regardless of whether or not the action affects the planning, conduct, reporting, or application of science.

Chemical professionals should take responsibility to act or intercede where possible to prevent misconduct. This includes reporting suspected research misconduct, as well as any discrimination, harassment, bullying, dishonesty, fraud, misrepresentation, coercive manipulation, or censorship.

Academic Professional Guidelines

... The ACS has established the Academic Professional Guidelines as a fair and just balance among the legitimate interests of all facets of the higher education community and recommends that these guidelines be accepted and implemented.

These Guidelines apply to those members of the academic community whose job function impacts directly or indirectly on students and scientists involved in the chemical sciences and represent recommended practices to foster productive working relationships among all chemical scientists in academe. For brevity, the term “chemical scientist” is used broadly in these Guidelines to refer to undergraduate and graduate students, post-doctoral and research associates, technicians, staff members, and all part-time and full-time faculty members involved in chemical sciences and engineering...

Excerpted from “General Guidelines” section of the Academic Professional Guidelines

Chemical scientists should take personal responsibility for:

- ...
- Maintaining high standards of honesty, integrity, ethics, and diligence in the conduct of teaching, research, and all other professional responsibilities.
Excerpted from “The Student and Postdoctoral Associate” section of the Academic Professional Guidelines

This section applies to any student or scholar involved in studying the chemical sciences including graduate students, postdoctoral scholars and undergraduates participating in scholastic activities such as teaching, learning, research, or collaboration. By nature, many students are learning the chemical sciences for the first time and they should be familiar with the basic guidelines for conduct in the field such as those outlined in The Chemical Professional’s Code of Conduct and Creating Safety Cultures in Academic Institutions: A Report of the Safety Culture Task Force of the ACS Committee on Chemical Safety.

A. Responsibilities towards Studies

Students are responsible for understanding all requirements necessary to complete their specific degree and they should actively strive to complete each requirement on schedule as expected by the institution and/or the faculty advisor. Students are responsible for monitoring their own progress throughout their degree program. As scholars, all students should take responsibility for their own learning and intellectual development. This includes reading primary literature, attending seminars and conferences, and asking questions of other scholars. Students in the chemical sciences must also be responsible for their own professional development, exploring possible career opportunities in the field of chemistry and working towards achieving them.

Excerpted from “The Department” section of the Academic Professional Guidelines

The department has the most direct responsibility to create a safe, high-quality environment in which a combined teaching, learning, and research experience fosters the professional development of students, staff members, and faculty. Departments must establish and nurture a culture of safety among faculty, staff, and students. Students should be instructed in the aspects of modern chemical safety appropriate to their educational level and scientific needs. They should be made aware that virtually all laboratory incidents are preventable when hazards and risks are minimized and proper procedures are followed.

B. Responsibilities to Students

1. Courses: Programs training undergraduate students in the chemical sciences are strongly encouraged to develop and implement curricula that meet the ACS Committee on Professional Training guidelines (http://www.acs.org/content/acs/en/about/governance/committees/training.html). The department should contribute to the maintenance of the institutional course catalog that informs students of the requirements for each degree offered. All instructional technology (websites, lecture notes, ancillary materials) should meet universal web design standards for website accessibility ensuring students with disabilities have a level educational playing field in the chemical sciences.

Excerpted from “The Institution” section of the Academic Professional Guidelines

Responsibilities

Institutions have a responsibility throughout the hiring and recruitment process to advertise all faculty and postgraduate employment opportunities and graduate assistantships widely, follow
the institution’s published ethical, equal employment and legal policies, make fair and equitable salary and start-up offers, and ensure that all candidates have the information needed to make informed and responsible decisions regarding their employment or course of study.

**The Global Chemists’ Code of Conduct**

**Introduction - Making Positive Change Happen**

Chemical practitioners should promote a positive perception and public understanding and appreciation of chemistry. This is done through research, innovation, teamwork, collaboration, community outreach, and high ethical standards. Chemistry professionals should act as role models, mentors, and advocates of the safe and secure application of chemistry to benefit humankind and preserve the environment for future generations. They should instill and encourage curiosity and innovation early and often, and recognize and award achievements where appropriate. Finally, chemistry professionals should provide professional inputs and opinions to government and other decision makers regarding industrial, environmental, and other issues.

... 

*Excerpted from the GCCE Guide for Use by Academia*

As chemical practitioners in academia, you are critical to ensuring sustainable ethical conduct in chemistry around the world, both now and in the future. Specifically, we encourage you to

- Share the language and spirit of the GCCE, The Hague Ethical Guidelines, and the Code of Conduct Toolkit with colleagues in your country;
- Together with your colleagues, use the GCCE workshop materials to determine whether the code should be modified or augmented to address specific issues in your country or institution;
- Promote open discussion of chemical ethics issues with colleagues in your home institution and at the national level and work together and with policy makers in your country to solve them,
- Seek opportunities to integrate ethics into educational curricula and training programs, and
- Encourage ethical conduct across the chemical enterprise in your country and around the globe.

**ACS Committee on Ethics**

The Committee on Ethics promotes and supports high standards of ethical conduct and integrity in the community of chemistry and related disciplines for the benefit of science and society.

**Mission**

To provide and promote resources and activities that educate, guide, and recognize chemists in ethical decision-making.
Goals
- By 2023, develop and disseminate five educational projects for use by local sections.
- Develop collaborative programming on ethics with other groups, both inside and outside of ACS.
- Increase the members’ recognition of ethics in their careers and its impact on society.

Vision
Leading a culture of ethics in chemistry.

https://acsethics.org/

ACS Comment
William Leong, What’s ethics got to do with it?, Chemical & Engineering News, May 16, 2021

We see ethical issues impact academia, where remote learning environments allow for more instances of academic dishonesty. There is an uptick in the number of methods for students to cheat on exams and homework assignments. A growing debate has emerged in the academic community on which group faces the biggest loss when cheating occurs. Is it the cheating students, who rob themselves of an education? Is it their honest classmates, who are penalized through the grading curve? Or is it the educational institutions, who find themselves on the defense? In navigating the complex and challenging world in which we are tested every day, we must follow ethical behavior in all aspects of our work.

Case Studies for Ethics Education in Chemistry
The 13 case studies are organized into four categories:
1. Interpersonal Dynamics
   - Case of a Day Early and Grade Short
   - Case of Conflicting Criteria
   - Case of Humorous Harassment
   - Case of Interpersonal Dynamics
2. Collecting and Managing Data
   - Case of the Prevaricating Postdoc
   - Case of Manipulating Data; Moving Ahead
3. Safety and Comportment
   - Case of the Dangerous Doc
   - Case of Deceptive Description
   - Case of Unsafe Acceptable Over the Ocean
4. Cheating, Dishonesty, and Plagiarism
   - Case of the Cheap Chemist
   - Case of the Redistribution of Wealth
   - Case of the Compromised Computer
   - Case Between Bribery and Gratuity

Programs
Pacifichem 2021
Ethics in the Chemical Profession: Cultural Impacts (#96)
Organizers: Schelble, Susan M; Do, Choon Ho; Lim, Kieran Fergus; Greenblatt, Lynne
Abstract: The COVID-19 pandemic precipitated a transition from face-to-face instruction to virtual teaching modalities. This transition brought about an increase in the incidence of academic dishonesty as well as the evolution of novel methods of cheating. Additionally, the use of online “help” sites as platforms that enabled academic dishonesty became more prevalent. This chapter presents a historical perspective of academic dishonesty while addressing the motivation and cultural norms that lead students to cheat. Furthermore, this chapter discusses the evolution of cheating and the role ethics plays in maintaining academic integrity.
Supplement on the Teaching of Professional Ethics

The ACS Committee on Professional Training recommends that instruction in professional ethics be part of the undergraduate chemistry curriculum. This instruction may help students achieve the following results. (1) Ethical sensitivity: students should understand that science is filled with ethical judgments and they should be able to recognize the ethical component of complex situations. (2) Knowledge of relevant standards: students should learn the professional standards of chemists as articulated in the ACS "The Chemical Professional's Code of Conduct (2007)" and in relevant works on scientific ethics. (3) Skill in ethical decision making: students should learn to analyze complex ethical problems and design appropriate solutions. (4) Ethical actions: often the most ethical course of action is difficult. By education and example, chemistry faculty can help students act ethically in difficult situations encountered later in their professional lives.

Beyond the intrinsic value of exposing students to professional ethics, education in responsible conduct of research is mandated for all researchers (including undergraduates) supported by grants from the National Science Foundation or the Department of Health & Human Services (e.g., NIH).

There are many important and interesting questions in professional ethics. The following could profitably be part of any program of instruction:

- Responsible treatment of data: Since no scientist uses or reports all the data, students need to learn when data can be discarded. They also need to learn how to use and report data.
- Reporting scientific information: Science is based on a principle of open communication. Students should learn the standards related to publication of scientific results, including proper citation of others' work, the standards related to plagiarism, and questions of intellectual property.
- Responsibilities of the peer review system.
- Conflicts of interest: All scientists have competing interests. Some involve financial interests; others do not. Students should learn to recognize a conflict-of-interest situation and how to deal with it.
- When and how questions of possible ethical misconduct should be raised.
- Use of animals and humans in scientific research: While the use of animals and humans is relatively rare in chemical research, at least a brief discussion of these questions is important.
- Relationship of chemistry to society: What are the responsibilities of a chemist to society, both as a chemist and as a citizen, including areas such as sustainability and green chemistry?

Strategies for Instruction in Professional Ethics

Strategies for offering ethics instruction in chemistry include a guest-lecture program, a separate course, or integration of ethics broadly into the curriculum. Which is most effective depends on the goals and resources of the particular institution. A guest-lecture program may be the simplest. Experts in professional ethics can be invited to give lectures in appropriate courses or as part of a regular departmental seminar program. The advantage of this approach is its simplicity; it does not require significant changes in curriculum, nor does it ask often overburdened chemistry faculty to learn a new field. The disadvantages are that it is difficult to assure that all the relevant issues are covered and that a guest-lecture program can send the subtle message that ethics is just for a few experts and not important to the working scientist. Finally, it may be difficult to find and schedule speakers on a regular basis.

An attractive alternative is to create a separate course or to incorporate ethics as a significant part of an appropriate existing course such as a capstone course or a seminar for chemistry majors. Such a course might also be offered in conjunction with other science departments. Descriptions of such courses have appeared in
The advantage of a separate course is that coverage of relevant topics can be assured. The disadvantage is that it is often difficult to add a separate course to an already crowded chemistry curriculum. Finally, it can be difficult to find someone willing and able to teach such a course.

The third possibility is integration of ethics into the curriculum, raising and discussing ethical questions in all courses. The advantages are that the questions can be discussed in context, so that ethics will be seen by students as integral to the practice of science. The disadvantages are that it is difficult to coordinate instruction that is spread among a variety of courses and that all, or at least most, of the chemistry faculty need to be trained in the teaching of professional ethics. There are, however, some simple strategies for introducing professional ethics into any chemistry course. One is what is sometimes called the "ethics moment," which is merely raising a question of professional ethics, such as proper use of evidence, when it arises in context. A second is the "ethics homework problem." Here students are asked to write a brief essay concerning a question of professional ethics that arises in the course.

No matter which of these approaches is used, an important tool for teaching ethics is the incorporation of appropriate case studies, either hypothetical or real. Students can analyze cases, construct arguments related to all sides of an issue, and discuss these in class. Good ethics case materials are available in print and on the Internet.

**Sources of Materials**


Examples specific to chemistry can be found in *The Ethical Chemist: Professionalism and Ethics in Science*. J. Kovac (Prentice Hall, Upper Saddle River, 2004).


The Collaborative Institutional Training Initiative (CITI) in the University of Miami Medical School has developed online ethics modules for which institutional subscriptions are available. The modules include text and quizzes, and can be tailored for the physical sciences. Modules can be sampled at no cost at [https://www.citiprogram.org/Default.asp](https://www.citiprogram.org/Default.asp).

Other electronic resources can be found at [http://research-ethics.net/topics/overview/](http://research-ethics.net/topics/overview/) and [http://www.onlineethics.org/](http://www.onlineethics.org/). In addition, the ACS Committee on Ethics has links to electronic resources, including case studies, on its Web site: [www.acs.org/content/acs/en/about/governance/committees/ethics.html](http://www.acs.org/content/acs/en/about/governance/committees/ethics.html).
Student Cheating and the Fraud Triangle

By Jack Little and Stephanie Handel

It is common to see reports in the news media citing high-profile business fraud; the more well-known examples have been Enron, WorldCom, Tyco, Madoff, subprime mortgage loans, and insider trading, or the latest method of credit card fraud. Local newspapers carry stories on a bookkeeper for a small business, nonprofit, or local government who was arrested for embezzling funds from his/her employer. Business educators continue to be surprised when they discover students have cheated on a test or plagiarized in a paper. But do they ever consider where the fraudster learned this kind of behavior or where they committed their first fraudulent act? The following article outlines the psychological thought process that is often present when people commit a fraud and compares it with how a student might be thinking when they cheat in the classroom. Could these two be interconnected? Please read on.

Understanding the Nature of Fraud

In his book *Occupational Fraud and Abuse*, Joseph T. Wells (1997) discussed the Fraud Triangle, a model developed by W. Steve Albrecht in 1991. Expanding on the work of Donald R. Cressey and Edwin Sutherland, Wells illustrates that, for fraud to occur, three conditions must be present: pressure, opportunity, and rationalization. These three elements together form the Fraud Triangle (Figure 1).

First, there must be pressure on an employee, creating an incentive for him to misappropriate an asset or to commit a fraud. Common pressures faced by an employee include financial burdens, debts, gambling problems, or addictions. These pressures may motivate an employee to engage in unethical activities.

Second, the employee must have opportunity to commit a fraud. The employee must be aware of weaknesses in his/her company's internal control and also have the understanding and technical ability to carry out the fraud. The lack, real or perceived, of internal controls creates an opportunity to commit fraud, as the more likely the employee believes s/he will be detected, the less likely s/he will engage in the unethical behavior. In business, attempts are made to control deviant behavior through the implementation of strong

![Figure 1: The Fraud Triangle](image-url)
internal control systems such as the separation of duties. Strong internal controls are meant to safeguard assets and protect the integrity of the financial reporting process.

Third, the perpetrator must be able to rationalize the fraud or misappropriation. Essentially, s/he must be able to justify his/her actions. Common justifications may include statements such as, "They don't pay me enough here" or "I am not stealing the money, just borrowing it." Statements such as these are used by individuals to rationalize unethical behavior.

Under the Fraud Triangle model, all three factors—pressure, opportunity, and rationalization—generally must be present for a fraud to occur. No matter how much pressure or how well motivated a perpetrator is, if the opportunity is removed, he will not have the ability to commit a fraud.

The conditions associated with cheating can also be found with issues of academic integrity in collegiate institutions. Similar to fraudsters who intentionally misappropriate cash or other organizational assets, students who cheat intentionally deceive their course instructors about their mastery of course material and fraudulently affect the grading process. As such, the Fraud Triangle can easily be applied to student cheating, which is illustrated in Figure 2.

Students face pressure to excel—or even just survive—in the academic grading process and are motivated by their desire to receive a competitive GPA, regardless of their mastery of material. As pointed out by Davis, Grover, Becker, and McGregor (1992) in reviewing the work of Keller (1976), "69% of the students in his [Keller's] study cited pressure for good grades as a major reason for cheating" (p. 17). Whether because of a desire to stay in school, remain academically eligible for athletic teams, or receive a better job upon graduation, today's college students feel tremendous pressure to perform.

If internal controls in business are meant to safeguard assets and protect the integrity of the financial reporting process, then academic controls over educational testing and assessment should limit the opportunities for students to cheat and also protect the integrity of the academic reporting process. Measurements such as grades, GPA, and test results must be guarded to give adequate representation of each pupil's ability as well as his/her ability in relation to others. Fostering such an environment requires professors to create strong internal control systems in the classroom.

It is when these controls on testing conditions are not in place that opportunities to take advantage of the academic system are created and violations of academic integrity standards can occur. Students who take advantage of shortcomings in testing controls may rationalize their actions by placing blame or faulting others. They may justify their actions with statements such as, "It will only be once," "The test (or professor) was unfair," or the classic, "Everybody does it."

Prevalence of Cheating in Academic Institutions

Cheating is a significant and growing problem at collegiate institutions. As early as 1952, a study conducted at 11 American colleges reported that nearly two-thirds of students polled admitted to cheating (Harp & Taitz, 1966). Around that same time, a poll conducted of seniors at America's top collegiate institutions concluded that 26% of Columbia University seniors, 30% of seniors at Cornell University, and a whopping 54% of Notre Dame seniors had cheated (Harp & Taitz, 1966). Recent research has found that the magnitude of cheating on college campuses is increasing. According to Professor Donald McCabe of the Department of Management and Global Business at the Rutgers Business School and his colleagues Kenneth D. Butterfield and Linda Klebe Treviño (2001), issues of academic dishonesty among college students are not only prevalent but continue to grow. In a 2010 academic integrity survey developed by McCabe, more than 65% of student respondents indicated seeing another student cheat at least once during a test or examination at Texas Tech University (2010). Interestingly enough, McCabe's research also indicates that undergraduates majoring in business "self-report among the highest levels of the more serious forms of test and exam cheating (copying from another, using crib notes, and helping another to cheat)" (McCabe, 2005, p. 4).

This prevalence of cheating among American college students is further
supported by Stacy Carter and Narissra Maria Punyanunt-Carter (2006) in their review of Davis et al. (1992). Their statistics show a staggering 40%–60% of college students admitted “to cheating on at least one of their examinations” (p. 212). Furthermore, in a 2010 poll published by the Yale Daily News, more than 600 undergraduates—more than half of those polled—indicated they had “witnessed cheating over the course of their Yale careers” (Burt, 2010, para. 1). As recently as 2013, dozens of students at Harvard University received disciplinary action for their involvement in cheating on a take-home final exam (Perez-Pena, 2013). The prevalence of cheating evidenced by these instances and earlier research studies has driven many schools to adapt new honor codes or to re-evaluate, revive, and reinvigorate their traditional honor code policies (McCabe et al., 2001).

In 2008 Freddie Choo and Kim Tan conducted a study that explored the effects of Fraud Triangle behaviors on students’ self-reported propensity to cheat in class. The study asked students to report their propensity to cheat with reference to specific conditions (pressure, opportunity, and rationalization) and found that students’ overall self-reported mean propensity to cheat was 19.8%. When all three Fraud Triangle factors were absent, students’ mean propensity to cheat dropped to about 8.3%; this increased to 33% when all three Fraud Triangle factors were present. The results of this study indicate that each Fraud Triangle factor influences the propensity of students to cheat.

Reports also indicate that cheating is not isolated to college students. In a poll of American high school student behavior conducted by the Josephson Institute Center for Youth Ethics (2012), 52% of the 23,000 or so high school students polled indicated they had cheated at least once during a test in school. This percentage decreased slightly from the previous Josephson Institute biennial polls: 59% of about 41,000 polled in 2010 and 64% of about 29,000 polled in 2008 indicated they had cheated at least once during a school exam; however, the numbers remain staggering. Recent cheating scandals by students at some of the nation’s top high schools (such as those at Stuyvesant High School in 2012 and the Great Neck North High School student SAT scandal in 2011) also support the prevalence of cheating for high school students.

Clearly, cheating in academic institutions remains prevalent in our society.

The Learning Environment

What type of academic environment needs to be created to minimize cheating on college campuses? The solution could involve three elements, as illustrated in Figure 3.

**Leadership.** The first element is leadership. The tone must be set from the top. Not only must colleges and universities have an established set of ethical standards in the form of a code of conduct and strong academic integrity policies, these standards must be embedded in the very culture of the institution and be visible to people at all levels. Students must be educated about ethical behavior. This study of ethics should begin early in students’ collegiate experience as students need to understand their institution’s academic integrity policy. During their tenure at school, students need periodic reminders of their commitment to high academic integrity standards in course syllabi and before exams.

**Control.** The second element is control. Just as there are internal controls to safeguard assets of the collegiate institution, there must also be controls over academic testing and the projects students complete. This is a time-consuming and thankless task but an absolutely essential element of an instructor’s job. The responsibility to prevent cheating on exams and other academic projects lies, at least partially, with teachers and college professors. Just as a business must create effective internal control systems to safeguard its assets, professors must apply controls to safeguard the academic process and to deter cheating. Universities must create standards of academic integrity and effectively communicate these standards to the student body. Professors must discuss these standards in their course syllabi. The McCabe Academic Integrity Survey conducted at Texas Tech University by Donald McCabe in 2010 found that “faculty members are the primary source for students’ learning about academic integrity policies at Texas Tech” (p. 8). Effective communication is essential, and students need to be reminded of their responsibilities under their institution’s academic integrity policy. To create an air of professionalism and accountability
in the classroom, students must be well informed on how academic standards affect their coursework and they must be held responsible for their actions when breaches of these standards occur.

Professors must not just create but also implement and adhere to controls over testing. Things as simple as creating multiple exam versions, offering adequate space to administer an exam, and providing proper supervision of test takers by professors and teaching assistants can help to drastically reduce the amount of cheating that occurs. In their article "Academic Dishonesty: Prevalence, Determinants, Techniques, and Punishments," Davis et al. (1992) found that about 80% of cheating techniques involved using cheat sheets or copying answers from another paper. If professors created even a few internal control procedures, this percentage could easily be lessened. For example, Kerkvliet & Sigmund (1999) found that simply adding an additional test version reduced the probability of cheating by 25% and adding an additional proctor decreased cheating by 11%. The elimination of cell phones, tablets, and memory calculators in exam rooms are essential controls when administering exams to today's high-tech students. Seating assignments are also crucial for large testing situations.

**Effective follow-up.** When a violation of academic integrity is discovered, effective follow-up entails faculty members carefully following the guidance offered in the school's academic integrity policy. The prosecution of such an incident is yet another time-consuming, thankless, but absolutely necessary part of the faculty member's job. Only by reporting such instances are teachers apt to deter future instances of cheating, not only by that individual, but by others who see or hear of the academic integrity process.

Although the strongest internal controls in academia do much to mitigate the effects of cheating, they will never be entirely effective in preventing students from engaging in this form of unethical behavior. Just as in business, even the strongest internal controls are sometimes penetrable. Ultimately, each student is left with a choice: choosing right from wrong. Through education, students learn and understand the connection between cheating in college and fraudulent behavior in their chosen profession.

**Conclusion**

Colleges and universities exist to educate young people and prepare them for entry into the workforce. It is the responsibility of these institutions to train students in academic, scientific, business, and technical fields. Professors must instill in their students the importance of moral and ethical behavior whether in school, in the workforce, or beyond. It is the job of collegiate institutions to ensure that students are equipped with the knowledge to make a rational, respectable, and informed decision when a potentially unethical situation arises in the workplace. When students learn that they can cheat while in school, there are no boundaries when the opportunity presents itself in the real world.

**References**


Texas Tech University. (2010). *Texas Tech University: McCabe academic integrity survey report.* Office of
continue networking and building lasting relationships. Many CTSO students make presentations to school boards or reach out to their community to gain financial resources to attend leadership conferences. Students are also given opportunities to speak with local, state, and on occasion, federal legislators to gain support for CTSO programs. These unique opportunities help CTSO students in developing their soft skills.

Daniel Lynch, a current lawyer, believes being a part of a CTSO through high school and college empowered him (personal communication, December 30, 2015). He asserted that

As a state and national officer, I learned how to listen to other people and find a commonality between their interests and desires and those of the group or organization. BPA created an environment where I was empowered to work creatively, in a group, toward a common goal. Unlike a graded classroom project, participation and involvement in any CTSO is voluntary. This implicit right to “walk away” is why my participation in BPA was the best preparation I had for the workforce. Unlike classroom projects that must be completed, projects within the workforce are not similarly mandatory and are not completed unless all parties see value in their completion. BPA taught me how to listen, understand, and communicate to an individual how the “project” (or group goal) is of value to him or her. This is a skill that I constantly use in the workforce that is not unique to my profession but is unique in that it is not easily taught in a classroom setting. BPA, and other CTSOs, provide students with the correct environment to practice achieving “buy-in” from their peers.

Through all of the opportunities CTSOs provide students, they are ensuring that students’ resumes are full of all the soft skills necessary to be successful in their careers and, more important, in their lives.

**Conclusion**

Appreciation is given to the efforts of each and every teacher; a standing ovation should be given to each one that gives endlessly of his/her time and energy to run a CTSO. At times it seems overwhelming and flat out exhausting. As job stability continues to pressure teachers to “teach to the test,” having time and energy to focus on CTSO programs gets harder and harder. Do not let that happen. It is important to make sure students gain the soft skills that employers so desperately need and want from employees. CTSO advisors are a shining example of commitment and provide the leadership students need. When holding a meeting, preparing for a competition or leading a community service project seems unimportant—think again. The soft skills that are instilled in students through the activities provided through CTSO participation will withstand the test of time and provide students “success beyond measure.”

**References**


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Open Forum...continued from page 40


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TAB 12
ACS Highlights
July 2021 – February 2022

Key points of contact:
Sr. Director, Education – Terri Chambers (t_chambers@acs.org)
Strategy – Jodi Wesemann (j_wesemann@acs.org)
Pre-College Engagement – Adam Boyd (a_boyd@acs.org)
Student Experiences and Academic Support – Nancy Bakowski (n_bakowski@acs.org)
Science Outreach – Lily Raines (l_raines@acs.org)
Student Communities – Nicole Di Fabio (n_difabio@acs.org)
Student and Postdoctoral Scholars – Joerg Schlatterer (j_schlatterer@acs.org)
Career and Professional Education – Bryan Tweedy (b_tweedy@acs.org)

Goal 3: Supporting Excellence in Education
Foster the development of innovative, relevant, and effective chemistry and chemistry-related education

A collection of ACS activities is advancing lifelong learning and building chemistry education capacity.

- **Increasing effectiveness and reach of career and professional development activities**
  Lifelong learning is being advanced by integrating and improving access to ACS resources:
  - Launching the ACS Institute, an online learning portal offering a robust collection of learning and training resources developed and reviewed by leaders and experts across the chemistry community, organized by competencies and seven ACS Centers:
    - Chemistry in Practice
    - Lab Safety
    - Leadership Development
    - Professional Development
    - Scientific Communication
    - Technical Skills Development
    - Volunteer Development
  - Offering the 2021 ACS Leadership Institute in a virtual and extended format, starting in January, with track refreshers in March and June and additional courses in May and July. An extended format will also be used with the 2022 ACS Leadership Institute, with the in-person event rescheduled for May.
  - Adding the Careers & the Chemical Sciences website to the career resources collection.
  - Offering ACS Career Pathways workshops at regional meetings, ACS Fall 2021, ACS Spring 2022, and in India.
  - Continuing to offer an expanded series of New Faculty Workshops, the Postdoc to Faculty Workshop, and ACS Virtual Classrooms to support career exploration and development.
• **Fostering continued engagement with ACS at key education/career transitions**

ACS is advancing lifelong learning in holistic ways that incorporate academic, scientific, career development and mentorship, while exploring various approaches for engaging students, educators, and mentors.

− In 2021, the US National Chemistry Olympiad program enhanced the experience of high school students participating, hosting a virtual social for nearly 1000 national exam nominees, as well as a virtual study camp alumni social and research talks. It also celebrated another successful Team USA that earned two gold and two silver medals at the 53rd International Chemistry Olympiad.

− The ACS Project SEED program held a second virtual summer camp in 2021, involving over 345 high school students, 82 cabin leaders, and 19 mentors, as well as piloting virtual research projects with 28 students at 11 sites.

− Student programming at ACS Spring and Fall 2021 meetings piloted virtual platforms for the undergraduate research poster session, the ACS Student Chapter awards ceremony and social, the graduate school fair, and the graduate student and postdoc reception. Student programming for ACS Spring 2022 will include in-person, virtual, and hybrid sessions.

− The ACS Student Chapter Awards program is recognizing 49 outstanding, 72 commendable, and 86 honorable mention chapters for 2020-2021 activities. The ACS Green Chemistry Institute is recognizing 27 chapters for green chemistry accomplishments.

− The ACS Journal Club continued, offering events with editors of ACS journals and a framework for events hosted by student communities.

− A special promotion of 50% off for new members increased the total number of ACS International Student Chapters to 93 in 29 countries, and the number of ACS Graduate Student Organizations to 10, which were supported by a summit held July 14 in conjunction with ACS on Campus.

− The Lasting Encounters between Aspiring and Distinguished Scientists (LEADS) Conference, an in-person 3-day event focused on preparing high-potential young professionals and students for successful and impactful careers that address global grand challenges, has been postponed until July 18-20.

− A mentoring workshop for graduate students and postdocs was piloted. Plans were developed for offering it in 2022.

− In 2021, the ACS Summer School on Green Chemistry and Sustainable Energy was held virtually with students from North and South America. In 2022, the summer school is tentatively scheduled to return to the Colorado School of Mines, July 15-22.

− The Get the Facts Out (GFO) campaign more than doubled the number of chemistry champions, due to outreach to college and university departments, and participated in hosting the first annual GFO mini-conference.

− Alumni of the ACS-Hach Second Career and Post-baccalaureate Teacher Scholarship programs participated in a mentoring program, providing support during the first three years of classroom teaching. ACS-Hach Mentors participated in newly developed mentor training during 2021.
• **Fostering effective use of evidence-based practices**  
A variety of approaches are being used to build chemistry education capacity:  
  - *Guidelines for Advancing Diversity, Equity, Inclusion, and Respect* in programs offering Bachelor’s degrees in chemistry were developed.  
  - The virtual meetings for Department Chairs, started in 2020, continued in 2021 with four events focused on 1) the pandemic effects on department budgets, 2) academic integrity, 3) being a new department chair, and 4) using DEIR and universal design to reimagine general chemistry, each attended by 100-150 department chairs. Managing stress was the topic of the first 2022 meeting.  
  - In response to needs identified during the 2020 Department Chairs meetings, ACS developed a mini-grant program that is supporting the facilitation of 44 short courses, as well as a template and modules, to help general and organic chemistry students returning from remote instruction develop hands-on laboratory skills.  
  - Goals and tactics that serve and reflect the needs of diverse audiences have been developed for *ChemMatters, Chemistry Solutions, inChemistry*, and the Student Experiences Office. As an example, *ChemMatters* magazine is providing students with the opportunity to see individuals of diverse backgrounds represented in the sciences, fostering a sense of belonging in the scientific community for all, and empowering students to see themselves in the sciences. A Diversity and Inclusion Initiatives Award was among the three awards *ChemMatters* magazine received from the Association Media & Publishing Network.

• **Enabling use of information, guidance, and learning resources by a broader range of education communities**  
Chemistry education capacity is also being built by:  
  - Initiating the ACS program for *Recognition of Global Programs in the Chemical Sciences*.  
  - Expanding the grant opportunities for ACS student communities to include community engagement and diversity, equity, inclusion and respect.  
  - Extending the reach of the *ACS Bridge Project*, leveraging corporate support of Genentech, PPG, and Dupont, as well as the *Inclusive Graduate Education Network*, to include 29 chemical sciences departments in 26 locations in the US, 59 ACS Bridge Fellows, and a collection of professional development activities.

• **Increasing visibility and relevancy of K–12 offerings**  
ACS continues to build K–12 chemistry education capacity with a focus on:  
  - Increasing membership in *AACT* by expanding and updating its online resource library. AACT ended the year with 8,725 members.  
  - Increasing engagement with *AACT* by initiating 256 partnerships for the 2021–2022 academic year through the *Science Coaches* program, piloting a two-phase application timeline, and by hosting 21 webinars, including a virtual summer symposium.  
  - Broadening the diversity of high school students participating in the *US National Chemistry Olympiad* program, offering webinars, coaching sessions, and recruitment grants.  
  - Providing updated fifth grade *Inquiry in Action* lessons and *Middle School Chemistry* lessons that support remote teaching and learning.
Offering subscribers free digital access to the high school magazine *ChemMatters*. A full digital archive of the magazine, searchable by article, dating back to its inaugural issue in February 1983 was made available for the first time as an AACT member benefit.

**Goal 4: Communicate Chemistry’s Value**

Communicate — to the public and to policymakers — the vital role of chemical professionals and chemistry in addressing the world’s challenges.

- **Supporting public awareness campaigns**
  - *Proud to Be a Chemist* launched in 2022.
  - *Chemists Celebrate Earth Week* 2022 will be celebrated virtually April 17-23 with the theme “The Buzz about Bugs – Insect Chemistry”.
  - *National Chemistry Week* 2021 was celebrated October 17-23 with the theme “Fast or Slow... Chemistry Makes It Go!”.
  - *inChemistry* magazine partnered with the National Nanotechnology Coordinating Office, creating and featuring content celebrating National Nanotechnology Day (October 9).

- **Updating outreach training and resources**
  - Learning and engagement strategies from the *ChemAttitudes* framework have been incorporated into a new approach for the Outreach Training Program.
  - To encourage safety, the RAMP framework has been incorporated into outreach materials for release in early 2022.

- **Continuing support for Chemistry Festivals**
  - The schedule for 2021 *Chemistry Festivals* included a mix of recently funded and postponed events, being held in-person and virtually. Two rounds of grants were awarded in 2021.
TAB 13
### ACS Acronyms and Abbreviations

**Updated 2022-02-24**

#### ACS DIVISIONS

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<th>Code</th>
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<td>RUBB</td>
<td>Rubber</td>
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<td>SCHB</td>
<td>Small Chemical Businesses</td>
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# ACS COMMITTEES

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<tr>
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<tr>
<td>B&amp;F</td>
<td>Budget and Finance</td>
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<tr>
<td>BOT</td>
<td>Board of Trustees, Group Insurance Plans</td>
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<td>C&amp;B</td>
<td>Constitution and Bylaws</td>
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<td>COMSCI</td>
<td>Science</td>
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<tr>
<td>CONC</td>
<td>Committee on Committees</td>
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<tr>
<td>CPRM</td>
<td>Patents and Related Matters</td>
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<tr>
<td>CPC</td>
<td>Council Policy</td>
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<tr>
<td>CPRC</td>
<td>Public Relations and Communications</td>
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<tr>
<td>CPT</td>
<td>Professional Training</td>
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<tr>
<td>CTA</td>
<td>Technician Affairs</td>
</tr>
<tr>
<td>CWD</td>
<td>Chemists with Disabilities</td>
</tr>
<tr>
<td>DAC</td>
<td>Divisional Activities</td>
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<tr>
<td>ETHX</td>
<td>Ethics</td>
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<td>IAC</td>
<td>International Activities</td>
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<tr>
<td>M&amp;E</td>
<td>Meetings and Expositions</td>
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<td>MAC</td>
<td>Membership Affairs</td>
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<tr>
<td>N&amp;E</td>
<td>Nominations and Elections</td>
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<tr>
<td>NTS</td>
<td>Nomenclature, Terminology and Symbols</td>
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<td>SEED</td>
<td>Project SEED</td>
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<td>SOCED</td>
<td>Society Committee on Education</td>
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<td>WCC</td>
<td>Women Chemists</td>
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<td>YCC</td>
<td>Younger Chemists</td>
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### OTHER ACS ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>2YC&lt;sub&gt;3&lt;/sub&gt;</td>
<td>Two-Year College Chemistry Consortium</td>
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<td>AACT</td>
<td>American Association of Chemistry Teachers</td>
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<td>BCCE</td>
<td>Biennial Conference on Chemical Education</td>
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<tr>
<td>CAS</td>
<td>Chemical Abstract Service</td>
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<tr>
<td>DEIR</td>
<td>Diversity, Equity, Inclusion, and Respect</td>
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<tr>
<td>GCI</td>
<td>ACS Green Chemistry Institute®</td>
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<td>GEAB</td>
<td>Graduate Education Advisory Board (transitioned to GSPSAB in 2021)</td>
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<td>GSPSAB</td>
<td>Graduate Student and Postdoctoral Scholars Advisory Board</td>
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<td>MPPG</td>
<td>Multidisciplinary Program Planning Group</td>
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<td>NFW</td>
<td>New Faculty Workshop</td>
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<td>NHCL</td>
<td>National Historic Chemical Landmarks</td>
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<td>ACS Petroleum Research Fund</td>
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<td>UPAB</td>
<td>Undergraduate Programs Advisory Board (transitioned to USAB in 2021)</td>
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<td>USNCO</td>
<td>US National Chemistry Olympiad</td>
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