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ACS Office of Two-Year Colleges

Two-Year College Chemistry Faculty Status Survey Spring 2010

Full Report
Spring 2011

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Background

The apparent increase in non-tenure-track faculty in higher education has been drawing attention from multiple groups both inside and outside of ACS. Within ACS, the Women Chemists Committee (WCC) formed the Non-Tenure-Track Faculty Task Force in 2008. In 2009, the Committee on Professional Training (CPT) conducted the Faculty Status Survey to study current staffing practices in departments that offer a bachelor's degree in chemistry.[1]

Since the US Bureau of Labor Statistics estimates that around 20% of post-secondary chemistry faculty work at two-year colleges,[2] it was deemed valuable to assess the status of chemistry faculty at these institutions. In the spring of 2010, the ACS Office of Two-Year Colleges, in partnership with the Division of Chemical Education Committee on Chemistry in the Two-Year College (COCTYC) and the Society Committee on Education (SOCED) Task Force on Two-Year College Activities, developed the 2010 Two-Year College Chemistry Faculty Status Survey.

Designed to parallel CPT's Faculty Status Survey, the Two-Year College Chemistry Faculty Status Survey was piloted in February 2010 and conducted March–May 2010. Survey responses were collected both online and in hardcopy. The results from the survey provide a snapshot of the landscape for two-year college chemistry faculty and will be used to inform future ACS activities and create a baseline for future data collection. The summary report, survey questionnaire, and raw data can be found at www.acs.org/2YFacultyStatus.

Quality of the Data

The survey was distributed to faculty and administrators representing 1,101 two-year college campuses across the country. ACS received 227 usable responses, for a response rate of 20.6%. Of the usable responses, only six indicated they were at a private institution, meaning that 97.4% of responding institutions were public.

In comparison, the National Center for Education Statistics reported that in 2009, 92% of the not-for-profit two-year colleges were public.[3] Thus, while the results of the Two-Year College Chemistry Faculty Status Survey likely provide a useful snapshot of the two-year landscape, they cannot provide a precise depiction of all two-year colleges.

Additionally, it should be noted that the survey results are based on self-reported data, and that institutions were not contacted to verify the accuracy of the responses. For example, an institution might report that a total of six general chemistry sections had been offered, with one section taught by permanent faculty and four sections taught by contingent faculty; in this case, it is unclear whether a faculty member from another department taught a section, the sections or faculty were miscounted, or the question itself was misunderstood. Regardless, all data sets were used as submitted.

Institutional Overview

Institutional and Program Characteristics

Part I of the survey provided insight into institutional size and types of programs offered, categories that were later used to sort the survey responses. Because only six responses from private institutions were received, the results were not separated by ownership of institution.

Figure 1 shows the chemistry enrollment by size of the responding institutions. Institution sizes were categorized as follows:

Small: fewer than 1,500 total for-credit full- and part-time students
Medium: 1,500-5,000 total for-credit full- and part-time students
Large: 5,001-12,000 total for-credit full- and part-time students
Very large: more than 12,000 total for-credit full- and part-time students

About 16.3% of the responding institutions enrolled fewer than 1,500 students, 35.7% enrolled 1,500-5,000 students, 29.5% enrolled 5,001-12,000 students, and 18.5% enrolled more than 12,000 students. Additionally, of the 227 respondents, 63 had fewer than 100 students enrolled in chemistry courses, 111 had 100-500 students, 45 had 501-1,500 students, and 7 had more than 1,500 students enrolled in chemistry courses.

Figure 2 correlates the number of degrees awarded with the number of students enrolled in chemistry courses. Not surprisingly, institutions that reported enrolling larger numbers of students in chemistry courses were also more likely to report awarding more chemistry or chemistry-based technology degrees. Additionally, a significant number of respondents across all categories reported that their institutions awarded no chemistry or chemistry-based technology degrees.

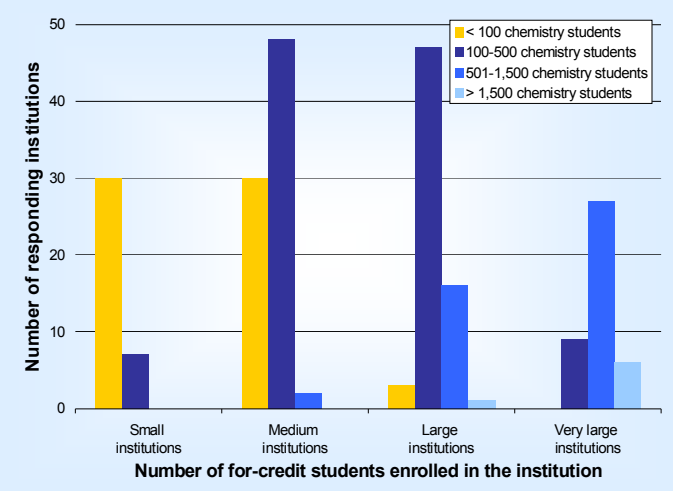

Figure 1. Number of 227 responding two-year colleges having given number of students enrolled in chemistry courses, by size of institution.

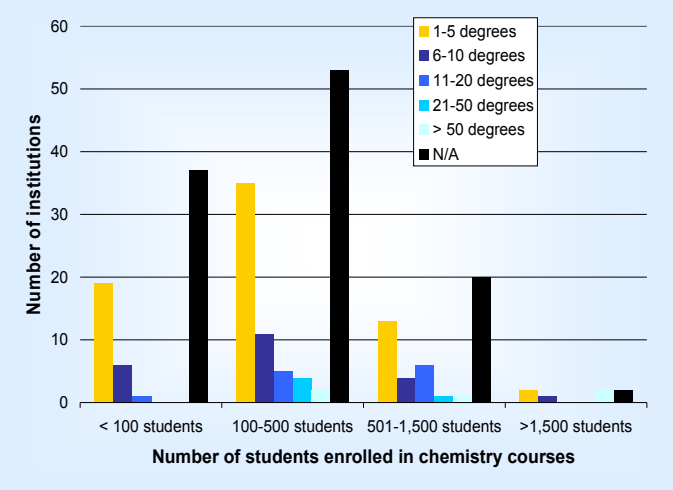

Figure 2. Number of 227 responding two-year colleges that awarded chemistry or chemistry-based technology degrees, by number of students enrolled in chemistry courses and number of degrees awarded.

The lack of degrees awarded can be illuminated by looking at the programs offered (Table 1). Of the 227 respondents, 60 indicated that they only offer transfer chemistry programs with no degree options.[4] An additional 47 indicated that their institutions had no chemistry programs at all; many of these institutions offered chemistry solely to support non-chemistry programs. In total, 47.1% of respondents are not in a position to offer chemistry degrees.

Of the survey respondents, 18.9% (43 responses) indicated they offered chemistry-based programs other than chemistry, chemical technology, process technology, biotechnology, or general sciences. These programs included engineering, biomedical science, environmental technology, forensic science, nursing, pharmaceutical manufacturing, fire science, and fuel cell technology. A complete list of other programs can be found in Appendix I.

The range of chemistry-based programs emphasizes the degree to which chemistry is used to support other programs. As a consequence, a wide variety of chemistry course offerings—and course titles—is supported in the two-year college community.

Course Offerings

Because course titles vary widely across two-year colleges, the course categories described in the *ACS Guidelines for Chemistry in Two-Year College Programs* were used to provide consistency in course reporting.[5] Participants were asked to identify their course offerings, regardless of course title, using the following categories:

Courses that can count toward a two- or four-year degree in chemistry or chemistry-based technology
(Note: these courses may also count toward non-chemistry degrees)

- **General chemistry:** overview of basic chemistry theory and practice.
- **Organic chemistry:** overview of organic chemistry theory and practice.
- **Specialty chemistry:** other chemistry courses, such as biochemistry or instrumental methods, which can count toward a degree in chemistry or chemistry-based technology.

Courses that cannot count toward a two- or four-year degree in chemistry or chemistry-based technology
(Note: these courses may count toward non-chemistry degrees or fulfill prerequisites for the above courses)

- **Preparatory chemistry:** introductory chemistry courses designed to prepare students for college-level chemistry.
- **General education chemistry:** chemistry courses designed to fulfill liberal arts distribution or similar requirements. Can be interdisciplinary.
- **Chemistry for allied health and health sciences:** chemistry courses specifically developed for students in allied health and health sciences programs.
- **Specialty chemistry for other fields:** chemistry courses specifically developed for students in programs of study other than chemistry or allied health/health sciences. Examples include primary and secondary educators, emergency first responders, and nuclear technicians.

More information on the course categories can be found in the *ACS Guidelines for Chemistry in Two-Year College Programs*.

Of the 223 responding two-year colleges, 217 reported offering general chemistry, 180 reported offering organic chemistry, and 34 reported offering specialty chemistry courses applicable to a chemistry or chemistry-based technology degree. Of the chemistry courses not applicable to a chemistry or chemistry-based technology degree, 117 respondents offered preparatory chemistry, 87 offered general education chemistry, 148 offered chemistry for allied health and health sciences, and 17 offered other chemistry courses.

Degree programs offered	*No degree program offered*	*Transfer program only (no degree)*	*Certificate*	*AA*	*AS*	*AAS*	*Other type of degree*
Chemistry	63	81	2	34	92	8	4
Chemistry-based technology	157	24	19	6	23	16	2
General science	64	51	3	44	105	14	5
Other	184	20	6	2	18	7	3

Table 1. Number of 227 responding two-year colleges offering chemistry-based programs, by type of degree offered.

Type of course	Chemistry lecture sections	Chemistry laboratory sections
General chemistry	40.1%	39.5%
Organic chemistry	11.8%	11.7%
Specialty chemistry courses	1.4%	1.1%
Preparatory chemistry	17.2%	9.8%
General education chemistry	7.2%	15.8%
Chemistry for allied health and health sciences	21.6%	21.2%
Chemistry for other fields	0.8%	0.9%
Total number of sections reported	2944	4343

Table 2. Percent distribution of total lecture and laboratory sections reported by all 223 responding two-year colleges, by type of course.

While many course offerings were clearly determined by the programs supported by the institution, external factors played a role in some cases. For example, one respondent reported that efforts to offer a chemistry major had been stymied by the state, which had designated organic chemistry as a 300-level course; because the two-year college was restricted from offering 300-level courses, it could not have a chemistry degree program.

Table 2 shows the number of responding campuses offering a given type of course and the relative number of sections offered. The laboratory sections have a similar, but not quite identical, distribution to the lecture sections. The discrepancy is most likely caused by the fact many larger lecture classes are split into smaller laboratory sections.

Reported specialty chemistry courses that can count toward a two- or four-year chemistry or chemistry-based technology degree included analytical chemistry, biochemistry, chemical health and safety, chemical calculations, and chemical technology. Other courses that were reported to be offered as part of the suite of chemistry courses, but were not applicable to a chemistry or chemistry-based technology major, included chemistry for educators, material and energy balance, chemistry of food preparation, funeral services chemistry, and chemistry and society. A complete list of courses can be found in Appendix II. As with the program titles, the course titles reflect the wide variety of programs in which chemistry plays an integral role.

Table 3 shows the average number of contact hours and students per section. Although the average number of students per section was around 20, some responding institutions reported lecture sections with as many as 90 students and laboratory sections with over 40 students. Most large lecture sections were separated into smaller laboratory sections, so large laboratory sections were the

Type of course	Total number of lecture sections reported	Average number of contact hours per lecture section per week	Average number of students per lecture section	Total number of laboratory sections reported	Average number of contact hours per laboratory section per week	Average number of students per laboratory section
General chemistry	1181	3.4	24.6	1715	3.7	17.0
Organic chemistry	346	3.2	17.3	507	3.8	11.8
Specialty chemistry courses	41	2.5	19.4	49	3.2	16.2
Preparatory chemistry	507	3.2	23.8	427	2.1	28.3
General education chemistry	211	2.9	26.4	686	2.2	8.1
Chemistry for allied health and health sciences	635	3.2	23.3	922	2.6	16.0
Chemistry for other fields	23	2.8	22.0	37	2.5	13.7

Table 3. Total number of lecture and laboratory sections and the average number of contact hours and students per section reported by 223 responding two-year colleges, by type of course.

exception rather than the rule. Just 15.2% of respondents reported general chemistry laboratory sections larger than the 25 students recommended by ACS guidelines; 8.9% of respondents reported organic chemistry laboratory sections with more than the recommended 20 students.[5]

Conclusions: Institutional Overview

The results of the Two-Year College Chemistry Faculty Status Survey revealed significant diversity in program and course offerings. Of the 227 respondents, 107 institution offered an AA and/or AS degree program in chemistry, 60 offered only transfer programs in chemistry without a degree, 46 offered an applied two-year degree in chemistry or chemistry-based technology, and 47 had no dedicated chemistry-based program at all.

The respondents to the survey reported offering a variety of chemistry-related programs and customized chemistry courses. The reported programs and courses addressed topics such as biotechnology, environmental science, health and allied fields, and forensic, fuel cell, and mortuary technology. Overall, 79.3% of respondents reported their institution offered chemistry courses tailored to non-chemistry majors.

Although institutions are facing increasing pressure to increase class sizes, on average section sizes remained under the 25 students recommended by the *ACS Guidelines for Chemistry in Two-Year College Programs* for laboratory courses. Additionally, students receive anywhere from 5.1 to 7.1 hours of chemistry instruction per week, with their time being fairly evenly split between lecture and laboratory.

Faculty Demographics

Part II of the survey collected information on the gender, ethnicity, and degree attainment of instructors in different categories of employment. Because two-year colleges can vary greatly in the titles and positions ascribed to their faculty, survey respondents were asked to define their faculty using the following categories:

Tenure-track/permanent: Tenured and pre-tenured faculty; includes faculty with unlimited contracts and other types of effectively permanent employment agreements.

Long-term, F/T: Full-time, non-tenure-track faculty and instructional staff with contracts of one year or longer.

Long-term, P/T: Part-time, non-tenure-track faculty and instructional staff with contracts of one year or longer.

Contingent, F/T: Full-time adjunct or other non-permanent faculty with contracts of less than one year.

Contingent, P/T: Part-time adjunct or other non-permanent faculty with contracts of less than one year.

Type of employment	*Total number of institutions reporting this type of faculty*	*Percentage of all faculty reported*
Tenure-track / permanent	157	29.7%
Long-term, F/T	60	10.5%
Long-term, P/T	45	10.8%
Contingent	156	49.0%

Table 4. Chemistry faculty reported by 208 responding two-year colleges, by type of employment.

Faculty Distribution

Table 4 shows the positions reported by 208 institutions. About 30% of the reported faculty positions were tenured, tenure-track, or otherwise effectively permanent. Just under half of all faculty positions were reported to be contingent, adjunct, or temporary. While most of the contingent faculty were reported to be part-time, 22 institutions reported having full-time contingent faculty; in all, 2.5% of the reported faculty positions were full-time contingent. Almost 31% of the respondents reported their institution did not offer any types of permanent teaching positions. At these institutions, 40% of the reported positions were contingent.

	All programs	*Degreed chemistry programs*	*Transfer only chemistry programs*	*Applied chemistry-based degree programs*	*Support programs*
Number of responding institutions	208	99	55	41	44
Type of employment:					
Tenure-track /permanent	29.7%	31.6%	33.4%	25.1%	23.4%
Long-term, F/T	10.5%	8.1%	7.3%	11.2%	14.7%
Long-term, P/T	10.8%	13.5%	3.4%	11.4%	11.9%
Contingent	49.0%	46.7%	55.9%	52.2%	50.0%

Table 5. Percent distribution of chemistry faculty reported by 208 responding two-year colleges, by type of employment and programs offered.

	All programs	Small institutions	Medium institutions	Large institutions	Very large institutions
Number of responding institutions	208	28	75	60	39
Type of employment:					
Tenure-track /permanent	2.3	0.8	1.3	2.3	5.2
Long-term, F/T	0.8	0.6	0.4	0.9	1.5
Long-term, P/T	0.8	0.1	0.3	0.9	2.3
Contingent	3.7	0.5	1.9	4.2	9.3

Table 6. Average number of chemistry faculty per two-year college, by type of employment and size of institution.

Table 5 lists the types of faculty reported by types of programs offered at two-year colleges. Across all institutions, contingent faculty comprised 49.0% of the faculty reported. Full-time/long-term and permanent faculty comprised 40.2% of all instructional staff.

Additionally, 32.7% of respondents, primarily those at small institutions, reported having no contingent faculty, according to the definitions provided. Of these, 70.6% reported having permanent faculty, 35.3% reported having full-time, long-term faculty, and 23.5% reported having part-time, long-term faculty.

Table 6 shows the average number of chemistry faculty reported per campus, by size of institution. Predictably, the total number of instructors reported grew with the size of the institution. Small institutions reported an average of one or two permanent or long-term faculty, plus one or two contingent faculty, while very large institutions reported an average of nine permanent or long-term faculty, plus another nine contingent faculty. Medium and large institutions fell in between. Overall, institutions reported having an average of 3.9 permanent and long-term instructors, plus 3.7 contingent faculty.

The percentages of faculty positions reported were fairly consistent across institution sizes, with contingent faculty comprising almost half of the positions. The exception was the small institutions, which reported a significantly higher percentage of permanent positions and a lower percentage of contingent positions. Smaller institutions were also more likely to report not having any contingent positions at all.

Gender Distribution

Table 7 shows the relative number of male and female chemistry faculty reported. Overall, close to 40% of all reported faculty were female, a percentage that did not vary much by type of employment. The percentage of female faculty reported in 2010 was an increase over the 2001 survey of two-year colleges, which found 32% of the faculty were female.[6]

Women comprised 36.0% of the faculty at responding institutions offering AA or AS degrees in chemistry, 44.9% of faculty at institutions with no dedicated chemistry program, and around 42% at institutions with either a non-degreed chemistry transfer program or an applied chemistry or chemistry-based technology degree program.

Race/Ethnicity

Respondents to the Two-Year College Chemistry Faculty Status Survey reported that 67.9% of all chemistry faculty were Caucasian. The percent distribution of the reported ethnicity of the two-year college chemistry faculty is shown in Table 8. Of the defined non-Caucasian ethnicities, Asian American was the most common (the "Other" category was not defined in the survey). Larger institutions reported a greater ethnic diversity, as did institutions offering degree programs in chemistry or chemistry-based technology.

The ethnic distribution of the faculty only partially matches the ethnic diversity of the students. NCES reports that 14% of students enrolled in public two-year colleges are African American, 7% are Asian American, 17% are Latino American, and 1% are Native American.[3]

Degree Attainment

Table 9 shows the percentage of each type of faculty reported to have a given degree across all reporting institutions. Most faculty had either a master's or doctorate as their highest degree in chemistry. Almost 60% of permanent faculty and close to 40% of contingent faculty held a doctorate.

Type of employment:	Total number of faculty reported	Male	Female
Tenure-track /permanent	469	58.2%	41.8%
Long-term, F/T	166	57.2%	42.8%
Long-term, P/T	170	64.7%	35.3%
Contingent	774	61.2%	38.8%
Total Faculty	1579	60.3%	39.7%

Table 7. Number and percent distribution of chemistry faculty reported by 208 responding two-year colleges, by type of employment and gender.

Type of employment	Total number of faculty reported	Caucasian	Asian American	African American	Latino American	Native American	Other
Tenure-track /permanent	469	73.8%	9.2%	3.2%	3.6%	1.9%	6.8%
Long-term, F/T	166	55.4%	7.8%	6.0%	2.4%	0.0%	25.9%
Long-term, P/T	170	57.6%	6.5%	7.1%	2.4%	0.0%	11.8%
Contingent	774	69.2%	9.3%	5.3%	3.5%	0.0%	8.0%
All faculty	1579	67.9%	8.8%	4.9%	3.3%	0.6%	9.9%

Table 8. Number and racial/ethnic percent distribution of non-Caucasian chemistry faculty reported by 208 responding two-year colleges, by type of employment.

Type of employment	Total number of faculty reported	Bachelor's	Master's	Doctorate	non-PhD doctorate
Tenure-track / permanent	469	0.2%	33.6%	58.6%	3.0%
Long-term, F/T	166	2.4%	39.2%	53.0%	3.6%
Long-term, P/T	170	4.7%	41.8%	45.3%	1.2%
Contingent	774	4.8%	48.9%	38.2%	1.4%
All faculty	1579	3.2%	42.6%	46.6%	2.1%

Table 9. Number and percent distribution of highest degree obtained by two-year college chemistry faculty at 208 responding institutions, by type of employment.

Table 10 shows the percent distribution of faculty degrees among institutions, by type of degree programs offered. The lowest proportion of PhD-holding faculty were reported by institutions that did not offer any type of degree in chemistry or chemistry-based technology; these same institutions also reported a higher percentage of faculty with Doctor of Education (EdD), Doctor of Arts (DA), or other types of non-PhD doctoral degrees.

Table 11 shows the percent distribution of highest degree obtained by chemistry faculty, correlated with institution size. The reported proportion of faculty with PhDs grew with institution size, while faculty holding non-PhD doctorates were reported to be more prominent at small and medium-sized institutions. Less than 8% of any type of faculty at any institution were reported to have no higher than a bachelor's degree.

Student Contact

As noted in Table 4, almost half of all reported faculty were contingent. Table 12 shows that 33.5% of reported lecture and 37.7% of reported laboratory sections were taught by contingent faculty in Spring 2010. Permanent and full-time, long-term faculty taught 59.6% of reported lecture sections and 55.2% of the reported laboratory sections.

As can be seen in Figures 3 through 6, contingent faculty were reported to teach a significant portion of all types of

Program offered	Total number of faculty reported	Bachelor's	Master's	Doctorate	non-PhD doctorate
All programs	1579	3.2%	42.6%	46.6%	2.1%
AA/AS Chemistry degree	798	2.0%	42.9%	51.8%	1.0%
Transfer chemistry (no degree offered)	382	4.7%	43.0%	42.6%	3.4%
Applied degree	490	2.4%	39.8%	47.5%	0.8%
No chemistry program	312	4.8%	43.3%	42.6%	3.2%

Table 10. Number and percent distribution of highest degree obtained by chemistry faculty at 208 responding two-year colleges, by types of chemistry programs offered.

Size of institution	Total number of faculty reported	Bachelor's	Master's	Doctorate	non-PhD doctorate
All institutions	1579	3.2%	42.6%	46.6%	2.1%
Small	68	7.4%	41.2%	45.6%	4.4%
Medium	296	4.1%	45.6%	33.1%	3.7%
Large	502	4.6%	44.0%	43.2%	1.2%
Very large	713	1.4%	40.4%	54.7%	1.8%

Table 11. Number and percent distribution of highest degree obtained by chemistry faculty at 208 responding two-year colleges, by institution size.

chemistry courses; however, they were more concentrated in the courses developed for non-chemistry majors. They were also reported to teach more laboratory sections than lecture sections, a situation that was reversed for the permanent faculty. In the lecture sections of courses applicable to chemistry majors, a slight majority of sections (51.0%) were taught by permanent faculty; about 24% were taught by contingent faculty. The percentage of sections taught by contingent faculty rose to over 40% in those courses that could not be applied to chemistry majors.

With two exceptions, little significant variation was observed in the responses with regard to institution size, types of programs offered, or specific categories of courses (i.e., general, organic, specialty, preparatory, and general chemistry for non-chemistry majors). The first exception was that respondents from small institutions reported less than 20% of chemistry courses were taught by contingent faculty; this finding aligns with the earlier observation that small institutions reported having fewer contingent faculty.

The second exception was observed in the results for general chemistry courses applicable to chemistry majors. As shown in Figure 7, the responding institutions offering non-degreed transfer chemistry programs reported that 58% of their general chemistry lecture sections were taught by permanent faculty. Those offering transfer degree programs in chemistry reported that 49% of general chemistry lecture sections were taught by permanent faculty. The responding institutions offering applied chemistry-based technology degree programs reported that 44% of the general chemistry lecture sections were taught by permanent faculty, and those without a dedicated chemistry program reported that 32% of general chemistry lecture sections were taught by permanent faculty. A similar trend was noted for the laboratory sections.

Type of employment	Lecture sections	Laboratory sections
Tenure-track / permanent	44.3%	41.3%
Long-term, F/T	15.3%	13.9%
Long-term, P/T	6.8%	7.2%
Contingent	33.5%	37.7%

Table 12. Percent distribution of lecture and laboratory sections reported by 161 responding two-year colleges, by type of faculty.

At most of the responding institutions, less than 30% of the general chemistry lecture courses were taught by contingent faculty. However, the 33 institutions that offered applied chemistry-based technology degree programs reported that 45% of the general chemistry lecture sections were taught by contingent faculty. Because chemistry-based technology programs are committed to preparing students for the workplace, they often work closely with

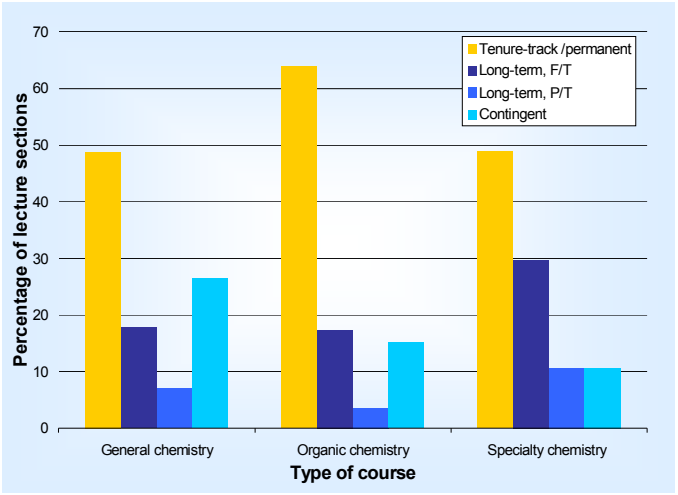

Figure 3. Percent distribution of lecture sections taught by two-year college chemistry faculty for courses applicable to a chemistry or chemistry-based technology major at 161 responding institutions.

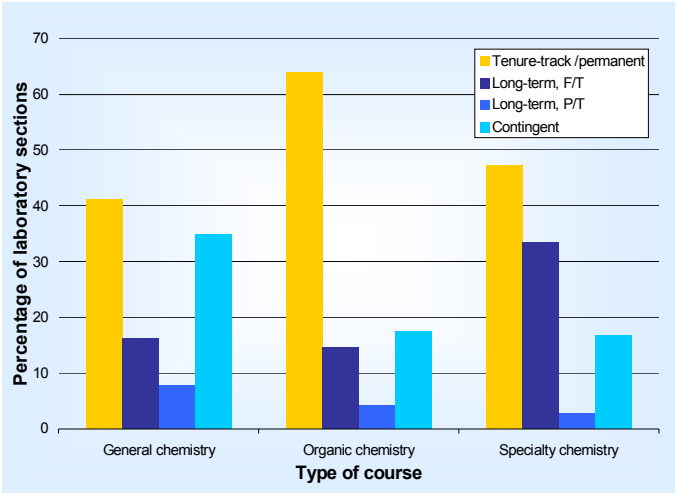

Figure 4. Percent distribution of laboratory sections taught by two-year college chemistry faculty for courses applicable to a chemistry or chemistry-based technology major at 161 responding institutions.

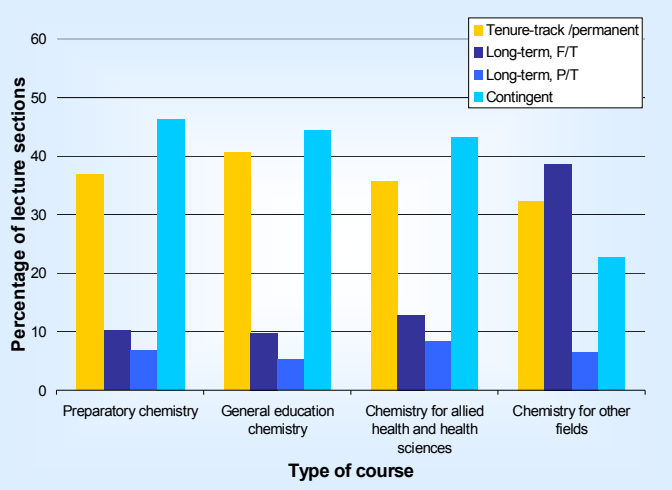

Figure 5. Percent distribution of lecture sections taught by two-year college chemistry faculty for courses not applicable to a chemistry or chemistry-based technology major at 161 responding institutions.

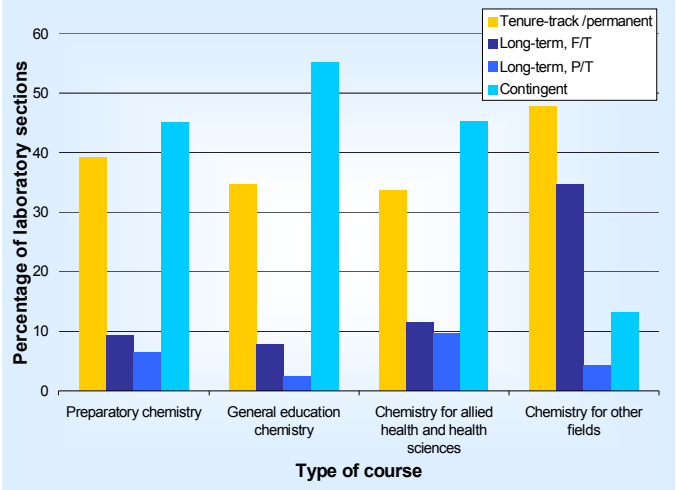

Figure 6. Percent distribution of laboratory sections taught by two-year college chemistry faculty for courses not applicable to a chemistry or chemistry-based technology major at 161 responding institutions.

potential employers of the program graduates. Consequently, it is not uncommon for current employees of the partnering organizations to teach courses in the program. Having such contingent faculty helps provide a workplace perspective in chemistry-based technology courses.

Conclusions: Faculty Demographics and Student Contact

Faculty demographics for responding institutions varied little by size of institution or types of programs offered. Across the board, 40% of reported two-year college chemistry faculty and instructional staff were female, and more than 30% of all reported faculty were non-Caucasian.

While not all two-year colleges offer tenure, some have rolling contracts or other methods of making teaching positions effectively permanent. More than 30% of respondents indicated that they had permanent faculty of any type. At most reporting institutions, about half of the faculty were contingent; however, responses from two-year colleges enrolling fewer than 1,500 students indicate that only a quarter of their faculty are contingent. In total, 32.7% of respondents reported having no contingent faculty at their two-year college campus.

On average, contingent faculty were reported to teach about a third of all chemistry sections, more frequently teaching laboratory courses or courses that were not applicable to a two- or four-year chemistry or chemistry-based technology degree. Almost half of reported general chemistry and 68% of reported organic chemistry courses were taught by permanent faculty.

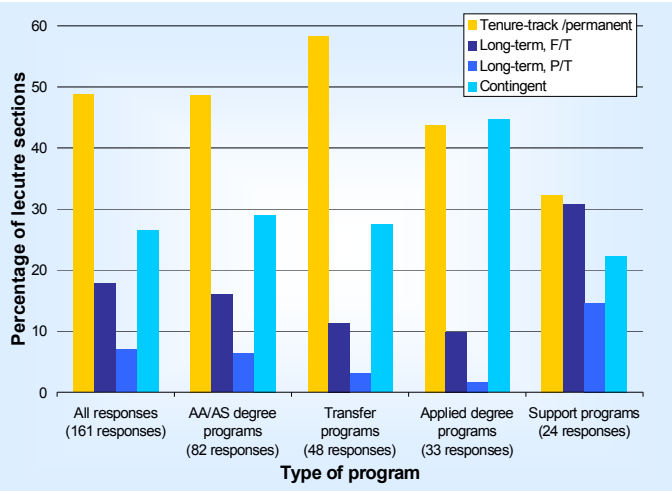

Figure 7. Percent distribution of general chemistry lecture sections taught by two-year college chemistry faculty at 161 responding institutions.

Employment Trends

In Part III of the survey, participants were asked if the number of courses taught by permanent faculty had increased, decreased, or stayed the same over the past five years. An increase was reported by 59 respondents, while 27 reported a decrease and 22 reported no change. However, one survey respondent noted that, while the number of courses taught by permanent faculty had stayed the same, the total number of courses had increased. As a consequence the ratio of courses taught by permanent faculty to courses taught by contingent faculty had decreased at that institution. It is unknown how many two-year colleges are experiencing similar situations.

Table 13 shows the percentage of faculty holding more than one position. About 56% of contingent faculty were reported to be working at more than one institution. No significant variation was observed based on institutional size or types of program offered.

Of the 198 respondents reporting on sabbatical-type arrangements, 148 reported that their institution had some type of formal or informal mechanism to obtain sabbatical leave, release time, reassigned time, or a reduced teach-

Type of employment	Teaching at another college or university	Teaching at a high school	Undergoing graduate studies	Employed in a non-academic setting
Tenure-track / permanent	3.8%	0.2%	6.6%	2.0%
Long-term, F/T	6.0%	0.0%	1.5%	1.8%
Long-term, P/T	32.4%	5.3%	1.2%	15.3%
Contingent	25.0%	9.3%	3.1%	18.2%
All Faculty	17.5%	5.2%	3.8%	11.4%

Table 13. Percentage of chemistry faculty reported by 198 responding two-year colleges to be working at another institution, in addition to the current teaching situation, in Spring 2010, by type of employment.

ing load. Another 38 reported having no such mechanism, and 12 were uncertain. In the Spring 2010 term, 52 chemistry faculty were reported to be on some type of sabbatical or reduced teaching load, and 30 chemistry faculty were reported to be serving as temporary replacements.

Employee Benefits

Part IV of the Two-Year College Chemistry Faculty Status Survey collected information on the types of benefits available to faculty in Spring 2010. Table 14 shows the percentage of institutions reporting faculty eligibility for specific benefits. Permanent and long-term, full-time faculty were reported to have roughly the same benefits. As noted in the Faculty Demographics section, about a quarter of two-year colleges do not have any permanent positions. Moreover, not all permanent positions are actually tenure-track; some are based on rolling contracts or other systems that make the positions effectively permanent. The similarity of benefits offered may be a result of the seemingly blurry line between permanent and long-term faculty. Fewer benefits were reported for contingent faculty than for permanent and long-term faculty.

Some respondents also reported opportunities for benefits not specifically mentioned in the survey, such as:

- Access to fitness equipment and other wellness resources
- Matching retirement funds
- Flexible spending accounts
- Dental or optical benefits
- Reserved parking
- Funding opportunities
- Tuition waivers
- In-house recognition and awards

	Tenure-track / permanent	Long-term, F/T	Long-term, P/T	Contingent	This benefit is not offered to any teaching staff
Private office space	92.7%	81.5%	18.9%	9.3%	6.6%
Shared office space	24.6%	28.9%	69.4%	81.5%	12.7%
Private computer access	97.2%	91.1%	41.5%	44.5%	2.1%
Advance notice of course assignments	96.6%	83.9%	68.3%	67.2%	1.6%
Participation in departmental faculty meetings	98.6%	87.5%	53.7%	53.9%	1.6%
Travel support to professional meetings	84.4%	80.0%	34.2%	23.2%	13.5%
Teacher development	90.6%	87.0%	59.0%	60.7%	7.1%
Other professional development	87.7%	85.2%	41.7%	48.6%	9.2%
Salary increases	84.8%	66.7%	48.7%	51.1%	14.3%
Access to research space	30.6%	28.6%	6.3%	8.1%	68.3%
Medical benefits	98.6%	91.1%	30.0%	25.9%	0.5%
Retirement plan	97.3%	89.3%	25.0%	25.9%	0.5%
Life insurance	95.1%	77.4%	17.9%	20.2%	5.9%

Table 14. Percent of 193 responding two-year colleges that reported offering faculty selected benefits, by type of employment and benefit offered.

In many cases, the faculty had to teach a minimum number of credit hours to be eligible. However, some institutions made their benefits available to all faculty, and at least one institution reported that all faculty were covered by a union contract.

It is worth noting that the availability of a certain benefit is not an indicator of the extent of its effectiveness. For example, one institution reported that professional development funding was capped at $150 per year per instructor, with no mechanism for pooling funding within the department. Additionally, some respondents reported that while they supposedly had access to professional development funding, their department or division chair did not see the value in applying those funds to chemistry-related activities.

Multiple institutions reported significant issues with funding. For example, although faculty were eligible for salary increases, cutbacks at the state level had resulted in salary freezes, furloughs, and even layoffs at some institutions.

Concluding Remarks

The results of the Two-Year College Chemistry Faculty Status Survey provide insight into the unique landscape of two-year colleges. A great deal of variety was reported in terms of chemistry-based courses, programs, and degrees offered. The variations were not aligned with institution size or type of program offered.

A relatively large number of faculty positions were not permanent. Almost 30% of the two-year college respondents reported their institution offered no permanent teaching positions; additionally, about half of all teaching positions were held by contingent faculty. Approximately one-third of chemistry sections (more frequently laboratory sections or chemistry courses designed for non-chemistry majors) were reported to be taught by contingent faculty.

Approximately 40% of faculty reported in the Two-Year College Chemistry Faculty Status Survey were female, about 70% were Caucasian, and most had either a master's or doctoral degree in chemistry. These demographics did not vary significantly by type of employment, size of institution, or type of program offered.

Over a third of two-year college chemistry faculty were reported to hold more than one position. Most, but not all, such faculty were contingent or long-term, part-time faculty working at more than one post-secondary institution or employed in a non-academic setting.

Almost three-quarters of respondents reported having sabbatical or reduced teaching-load options. Approximately 15% of faculty at institutions with these options were reported to be taking advantage of them.

Benefits were reported to be offered to permanent and long-term, full-time faculty on a nearly equal basis. Such benefits were extended to long-term, part-time and contingent faculty less frequently. Moreover, a number of respondents reported that budget cuts had limited access to their benefits.

The Two-Year College Chemistry Faculty Status Survey summary report, survey questionnaire, and raw data can be found at www.acs.org/2YFacultyStatus.

References and Notes

1. "Who Is Teaching Whom? Complete Report on the Fall 2009 CPT Survey of Chemistry Faculty Status." ACS Committee on Professional Training; ACS: Washington, DC. 2010. Available online at www.acs.org/cptfacultystatusreport (accessed December 2010).
2. US Bureau of Labor Statistics. *Occupational Employment Handbook, May 2009*. www.bls.org (accessed January 2011).
3. National Center for Education Statistics. *Digest of Education Statistics 2009*, http://nces.ed.gov/programs/digest/d09/index.asp (accessed 16 Jul 10).
4. Participants were allowed to select more than one program. For example, while 60 respondents reported offering transfer programs without degrees, another 21 reported offering degree programs in addition to the (non-degree) transfer programs.
5. American Chemical Society, Society Committee on Education. *ACS Guidelines for Chemistry in Two-Year College Programs*; ACS: Washington, DC, 2009; available on the ACS Web site at www.acs.org/2YGuidelines (accessed Jun 2010).
6. A Snapshot of Chemistry Programs and Faculty at Two-Year Colleges. Michael Neuschatz, Mary Ann Ryan, Jodi Wesemann, Janet M. Boese. *Journal of Chemical Education*. **2003**, *80(2)*, 129.

Appendix I: Chemistry-Based Programs Offered by Participating Two-Year Colleges

Engineering
- Basic Engineering
- Chemical Engineering

Biological
- Bioresource Development and Management
- Biomedical Engineering
- Biomedical Science
- Plant Biotechnology

Environmental
- Earth Science
- Environmental Technology
- Environmental Science

Forensic
- Forensic Science
- Science for Forensics

Health and Allied Medicine
- Clinical Laboratory Science
- Dental Hygiene
- Medical Laboratory Technician
- Nursing
- Respiratory Therapy
- Veterinary Assisting

Pre-Professional
- Pre-Clinical Laboratory Sciences
- Pre-Cytotechnology
- Pre-Dentistry
- Pre-Forensic Chemistry
- Pre-Medicine
- Pre-Pharmacy
- Pre-Physical Therapy
- Pre-Veterinary Medicine

Pharmaceutical
- Pharmaceutical Manufacturing Technology
- Pharmaceutical Sciences

Other
- Fire Science
- Food and Fermentation Science
- Hazardous Materials
- Fuel Cell Technology

Appendix II: Titles of Specialty Chemistry Courses for Chemistry and Non-Chemistry Majors

Reported specialty chemistry courses that can count toward a two- or four-year chemistry or chemistry-based technology degree include the following:

Analytical Chemistry
- Chemical Analysis and Instrumentation
- Chemical Technology Instrumentation
- Instrumental Analysis
- Organic Analysis and Spectroscopy
- Quantitative Analysis

Biochemistry
- Biochemistry
- Organic and Biological Chemistry

Chemistry-based Technology
- Chemical Technology I-IV
- Glass Blowing
- Introduction to Chemical Technology
- Technical Chemistry I & II
- Troubleshooting

Environmental Chemistry
- Environmental Technology
- Environmental Chemistry
- Green Technology

Health and Safety
- Chemistry of Hazardous Materials
- Chemical Health and Safety
- Chemical Laboratory Safety

Other
- Chemical Calculations II
- Chemistry for Engineers
- Computational Methods in Chemistry
- Forensic Chemistry
- Independent Research
- Introduction to Materials Science
- Inside the Pharmaceutical Industry
- Special Topics

Other reported courses that may be offered as part of the suite of chemistry courses, but not necessarily applicable to a chemistry or chemistry-based technology major, include the following:

Agriculture
- Physical Science I (for agriculture majors)

Education
- Chemistry for Educators
- Basic Chemistry Concepts (for elementary and middle school educators)
- Physical Science I - Integrated Chemistry (for elementary education majors)

Engineering
- General Chemistry for Engineers
- Fuels Lubricants and Coolants for Diesel Mechanics
- Material and Energy Balance

Food Service
- Food Science Chemistry (non majors course)
- Chemistry of Food Preparation

Forensic Science
- Forensic Science

Funeral Services
- Survey of Chemistry for Funeral Services and Veterinary Technology
- Funeral Services Chemistry

Other
- Chemistry and Society
- Chemistry of Hazardous Materials
- Pharmacology

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