



Report on the CPT Chemical Information Resources Survey

Summer 2013

Summary of Results from 2013 Information Resources Survey

- Schools generally report that current literature access at their institutions is adequate for course work, with slightly lower numbers for research.
- About a quarter of schools report some limitations on ILL, with master's departments reporting more problems than other types of institutions.
- Forty-six percent of the schools responding reported that elimination of the journal requirement would hurt their ability to maintain their literature holdings.
- The majority of programs (close to 60%) offer some kind of explicit training for students in the use of various information resources.

Background

The ACS Committee on Professional Training (CPT) last conducted a survey on library resources in the fall of 2000. As the Committee works to revise the current guidelines, it seemed like an opportune moment to conduct a new survey. In 2000, there were many concerns about the ability of library budgets to keep pace with increasing journal costs, and the ability of smaller departments, in particular, to provide adequate access to a

sufficiently broad array of current literature to meet the needs of their students and faculty. At that time, the key points raised by the 2000 library survey were those summarized and published as part of a CPT special report in the winter 2002 (see survey page at www.acs.org/cpt). The Executive Summary from that report is reproduced below.

At that moment in time, there was a great deal of concern about the rising costs of institutional journal subscriptions, the

Executive Summary from 2000 Library Resources Survey

- Out of 617 surveys, 416 were returned: this 67% return rate reflects the importance of chemical information issues to the academic chemistry community.
- Library budget cuts are beginning to have a noticeably negative impact on education in chemistry. Further reductions would have significant negative consequences for chemistry education.
- Expenditures for all forms of chemical information vary drastically depending on highest degree granted. Institutions at which the doctoral degree is the highest offered in chemistry spend almost 1 order of magnitude more on chemical information than do institutions conferring only bachelor's degrees. Institutions at which the master's degree is the highest degree offered in chemistry are especially struggling to afford chemical information.
- A "digital divide" is developing in the ability of institutions to provide modern electronic access to chemical information: doctoral institutions are far more able than master's or bachelor's institutions to afford significant numbers of electronic journal subscriptions and/or access to Chemical Abstracts through the SciFinder Scholar gateway.
- Despite significant improvements in electronic gateways to chemical information and databases, the use of chemical information in undergraduate chemistry curricula appears to be diminishing.

adequacy of interlibrary loan services, the difficulties associated with accessing *Chemical Abstracts*. Libraries were facing budget cuts which impacted journal subscriptions as well as monograph holdings. The rising costs associated with information access gave rise to some real concerns about differential access at larger, research-intensive institutions vs. smaller undergraduate institutions. The CPT recognized the difficulties many smaller institutions were having maintaining adequate and broad access to the literature, so the 2008 ACS Guidelines supported smaller institutions by maintaining a requirement that they have access to a minimum number of journal titles available on site, as well as requiring that institutions be able to provide access to *Chemical Abstracts*. These requirements allowed many institutions to maintain a minimal level of library budget funds.

2013 Survey Scope

CPT began thinking about an updated library survey around 2012. However, since the means by which chemical literature is accessed and navigated had changed so dramatically since the time of the last library survey, the decision was made that the focus of the 2013 survey should shift away from localized, on-site library holdings and budgets to better represent the nature of information access in the 21st century. The Committee solicited input from various science librarians who reported that questions about individual departmental

holdings or subscriptions histories were likely to be very difficult to evaluate in light of the shift to complex and wide-reaching consortial arrangements that are in place at many libraries these days. The Committee decided, therefore, that the more important questions to probe concerned chemical information resources more generally: access to current and archival chemical literature (rather than holdings) as well as access to other chemical information resources such as databases, search engines, and information management tools (e.g., bibliographic tools). In addition, in keeping with the shift in focus of the 2008 ACS Guidelines, the Committee wanted to probe the training that students receive in the skills they need to navigate and work with these resources. These skills include the ability to conduct different types of searches (e.g., structure, citation, keyword, CAS number, patent), to organize the information retrieved (bibliographic programs), and to understand and report on the information retrieved (written and oral communication of results, proper citation, etc.)

2013 Survey Results

In the summer of 2013, the CPT sent out a survey on Information Resources to 944 schools (both approved and non-approved programs). We received responses from 35% or 332 schools. Responses came from schools of different types: public vs. private (47.2%:52.4%), highest degree offered (57.2% BA/BS:

Summary of Results from 2013 Information Resources Survey

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 - Master's institutions as a group have the hardest time with literature access, with 82% of master's level schools reporting that archival access is adequate for research
 - In comparison, 94% of PhD schools and 87% of BA/BS schools report adequate access
- About a quarter of schools report some limitations on ILL, with master's departments reporting more problems than other types of institutions.
- Forty-six percent of the schools responding reported that elimination of the journal requirement would hurt their ability to maintain their literature holdings.
 - 58% of the bachelor's programs
 - 57% of the master's programs
 - 34% of the PhD programs
- The majority of programs (close to 60%) offer some kind of explicit training for students in the use of various information resources (e.g. structure searching, citation searching), either as a stand-alone course or as a significant portion of a course.

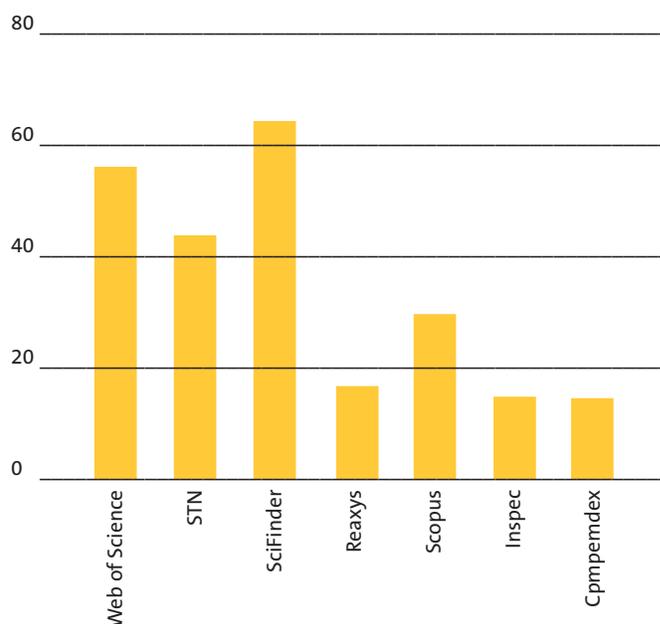
14.7% MA/MS: 27.7% PhD), and approved vs. non-approved programs (89.7%; 8.7%).

Based on the responses the Committee received, it is clear that the proliferation of digital packages and consortial arrangements means that access to the current literature is considerably less problematic for schools (particularly smaller ones) than it once was. The growing “digital divide” identified in 2000 seems to be less of a concern now than it was at the time of that earlier survey. That said, some schools (particularly smaller ones) do report some concerns over archival access as some digital packages are for current-year access only. In addition, for those institutions striving to maintain on-site, localized subscriptions and access, the continually rising costs of journal subscriptions — and continuing cuts in library and IT budgets at individual institutions — remain serious concerns. At the same time, roughly half of the

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responses received indicated that requirements for access to a minimal number of journals (as well as to Chemical Abstracts) have helped many schools maintain access to a broad array of high quality journals as well as the ability to meaningfully search that literature. Just over half of the public institutions responded that the journal requirement helped them maintain access to the literature, with the greatest impact felt at public bachelor’s and master’s programs. With the advent of digital content, interlibrary loan (ILL) has grown far less cumbersome than it once was, with most schools (> 94%) reporting that ILL access is generally adequate for teaching and research needs, both from the perspective of cost (few schools reported practical limitations on their ILL usage) and timeliness of response. A summary of the most salient results is given on opposite page.

% respondents with access to subscription-based database/search tools



In light of these responses, the new ACS Guidelines will retain the requirement that departments maintain immediate institutional access to a minimum number of journals. These journals should be high quality, peer-reviewed publications, and examples of possible titles are provided on the CPT web page. As always, this list is intended to provide guidance but is not a listed of required titles.

Beyond questions of access to the scientific literature, this survey queried the training that departments and institutions provide to students in how to make use of various information resources. Most institutions consider training students in the use of chemical information and resources important for all their majors, not just their research students. Of the most common subscription-based tools and databases, considerably more institutions have access to Web of Science, STN, and SciFinder than to other commonly used subscription-based tools such as Reaxsys, Scopus, Inspec, and Compendex. Though local access of these tools is often limited by numbers of seats or licenses, very few institutions (~2%) reported that the limitations were problematic for either faculty or students. Institutions reported widespread use of these as well as various free resources by students, in

course work as well as in research. The most commonly used tools in courses and research were Google Scholar (88%/93%), SciFinder (88%/91%), PubMed (85%/86%), Web of Science (57%/61%), PubChem (55%/61%), and US Patents Online (40%/56%). Patent searching was seen as far less critical than all other types of searching addressed in the survey (structure, keyword, citation, property).

Fifty-eight percent of the respondents reported that they explicitly train students in the use of these resources in a stand-alone course or as a significant portion of a designated course. In the majority of these institutions (83%), this course is taught by faculty members, and at most (85%), all chemistry majors are required to take this course. There is, however, a good deal of variation in the moment in their undergraduate years that students receive this training.

Forty-one percent of the institutions do not offer explicit training in the use of chemical information resources. Of these, 71% report that such training is distributed throughout the curriculum and that most students do receive some kind of training. They report a much greater variation in when students are exposed

to this information, as well as the quality and thoroughness of the training, with the focus being more driven by research-related interests than classroom needs.

Future Thoughts

It is clear that the means of accessing and searching through existing literature and data is changing rapidly. In the coming years new chemists will need to be thoroughly trained in the use of tools needed to search the literature, but also in tools that will allow them to manage, store, and record information responsibly and ethically (including bibliographic tools, electronic record keeping, institutional archives, among others). With these likely developments on the horizon, the Committee was pleasantly surprised to learn many departments already apparently train students explicitly in the use of at least some of the varied information resource tools (databases, search tools and engines focused on scientific literature and data).

Indeed, continuing in the direction first highlighted in the 2008 ACS Guidelines, the new guidelines will continue to emphasize the development of student skills in undergraduate training. ■