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Ice Cream Seminars for Graduate Students: Imparting Chemical Information Literacy

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Ice Cream Seminars for Graduate Students: Imparting Chemical Information Literacy

Jeremy R. Garritano

ABSTRACT. This article provides information on a chemical information literacy program designed primarily for new graduate students. The full implementation of this program is discussed, including defining its purpose, topics covered, content presented, methods of marketing, and evaluation. The result is a series of voluntary seminars given biweekly throughout the academic year. Seminars are based either around a particular resource or database or are centered on a topical problem that may be addressed using multiple resources. Evaluations show that graduate students are pleased with the seminars, including content covered and the format. Areas for future development and experimentation are also suggested.

KEYWORDS. Graduate students, information literacy, chemical information, library instruction, chemistry libraries.

BACKGROUND

While college students are often assumed to have graduated with requisite information literacy skills necessary to continue their education, the sheer diversity of library experiences

seen in any entering graduate student population is enough to shatter this illusion. In addition, the perceived gap between faculty expectations of graduate student library skills and their actual skills has also been recognized (Dreifuss, 1981). Though all graduates of an American Chemical Society (ACS) certified undergraduate program will have similar experiences in terms of their education in the subject of chemistry, the library instruction they receive at their respective institutions is not nearly as consistent. The Committee on Professional Training (CPT) of the ACS has published Guidelines and Evaluation Procedures for ACS certification which includes a brief section on Chemical Literature and Information Retrieval (Committee on Professional Training, 2003b). A supplement on Chemical Information Retrieval has also been published (Committee on Professional Training, 2003a). Focused on undergraduate education, this supplement outlines the chemical information topics and skills deemed important for students to learn as they become successful practicing chemists and includes a brief statement regarding the implementation of library instruction. Because these guidelines are not as descriptive or exact as some of the other CPT guidelines, there is still a concern about the levels of information literacy exhibited by incoming graduate students. To remedy this, supplemental library instruction is often necessary for graduate students if they are to effectively navigate the rest of their education and become productive chemists.

Kazlauskas (1987) has provided a careful analysis of the various methods of library instruction that can be offered to graduate students. Her report may be twenty years old, but the four methods of instruction she identified are still valid today:

1. Library instruction integrated into a credit course
2. Library instruction through workshops or seminars that meet outside credit courses
3. Specialized instruction within a particular discipline, particularly research methods

courses

4. Individual library instruction, usually one-on-one meetings with a librarian (Kazlauskas, 1987)

This paper will primarily focus on the second and third forms of instruction that Kazlauskas described.

The literature contains numerous examples of chemical information instruction as it pertains to undergraduates (Drum, Primack, Battiste, & Barratt, 1993; Hostettler & Wolfe, 1984; Lawal, 2001; Matthews, 1997). This literature also touches upon similar instances of all four aspects of instruction discussed by Kazlauskas. In some cases the techniques described may be transferred to the instruction of graduate students; however, there is scant literature on chemical information instruction originally designed for graduate students. Carr (1993; 2000) has analyzed the literature on teaching chemical information and in two separate studies spanning 1972-1998, has found that 56 articles have been published pertaining to educating undergraduate students versus 13 articles discussing graduate chemical information education.

The nature of chemical information itself offers further problems for graduate students. Because of the added complexity of information needs that chemical research requires, such as structure and reaction searching, advanced skills often need to be taught to graduate students (Somerville, 1990). Korolev (2001) suggests a number of ways to teach chemical information to international graduate students, including summer programs, special seminars, and mentoring. These methods can easily be expanded to all graduate students. Also, with a chemistry library housed in the same building as the chemistry department, chemistry librarians as subject specialists are in a position to provide a variety of support possibilities to graduate students (Michalak, 1976).

At Purdue University, these arguments and rationale have been used to create a graduate level instruction program. Each fall, the Chemistry Department enrolls between 50 and 60 graduate students, the Chemical Engineering Department enrolls between 20 and 30 graduate students, and graduate students are accepted in related fields such as pharmacy and food science. Because of this large number of new graduate students requiring the use of chemical information, and taking into account their varied backgrounds, additional opportunities for learning about chemical information need to be provided.

In terms of available opportunities to learn about chemical information at Purdue, there is a one credit course specifically covering the chemical literature required of all undergraduate chemistry majors earning an ACS certified degree. This course is offered through the Chemistry Department and is taught by library faculty members. There is no equivalent course for graduate students, though typically one to three graduate students enroll in the undergraduate course each year to supplement their knowledge. There is also no other course required of all chemistry graduate students that incorporates the chemical literature heavily into its coursework. Aware of this deficiency, the chemistry library staff created the Chemistry Library Ice Cream Seminars in 1998. These seminars are similar to successful workshops created by Ohio State University for arts and humanities graduate students (Bradigan, Kroll, & Sims, 1987).

The development of the seminars required five major areas of planning: establishing their purpose, finding the best format and time for presenting the seminars, choosing the seminar topics and content, marketing, and evaluation.

PURPOSE OF THE SEMINARS

Four major principles were identified to guide the purpose of the seminars. The first

principle is to focus the seminars on new graduate students requiring the use of chemical information. As will be discussed in more detail in the section on marketing, this includes graduate students outside of the chemistry department. The second principle of the seminars is to make attendees aware of the libraries on campus and their various resources, with a focus on those containing chemical information. This includes lesser known or smaller databases as well as those that would be considered interdisciplinary or not traditionally associated with chemistry. The third principle of the seminars is for those who attend to gain skills necessary to choose the most appropriate resource(s) for their information needs. While only one or two resources may be discussed at a seminar, it is necessary to acknowledge the wealth of additional resources available and to put the content of each seminar into context. This may include mentioning supplemental databases for searching or referring attendees to other librarians with additional subject expertise, such as for patents or bioinformatics. The final principle is to acknowledge that at Purdue, a graduate student's greatest information need occurs as he or she prepares for the oral candidacy examination. This examination occurs during the student's fifth semester and consists of two parts: an original proposition (OP) and the student's current dissertation research summary. The OP is required to be in an area not related to their doctoral research. This process creates anxiety in many graduate students as the OP requires extensive literature searching. Besides offering the seminars as a way to connect with graduate students before they reach this point, many of the seminars are designed to make the attendees aware of how to conduct as comprehensive a search as possible. Ackerson (1996) outlines a thorough model for accomplishing this.

Next, a variety of factors were considered to identify the best format for presenting the seminars. Because the seminars were not associated with any credit course, they would have to be as informal and inviting as possible without sacrificing substance. Also, because many graduate students, particularly new graduate students, are teaching assistants in

undergraduate courses, the timing of the seminars would need to avoid conflicting with many undergraduate chemistry courses. Additionally, with six other weekly divisional seminars in the chemistry department, the seminars would need to avoid these days and times as well.

To create a more informal setting, the location of the seminars is a small conference room within one of the chemistry buildings on campus. This room has a projector, which allows the person teaching the seminar to bring her/her own laptop. This is advantageous for the instructors because they can be certain that all necessary software is installed and they also have the ability to store presentations and examples of searches for easy retrieval. The room seats twenty people comfortably around a long table, with additional seating available for up to forty students and faculty total. With everyone, including the instructor, sitting at the same table, it creates a more relaxed atmosphere where everyone is able to see each other.

To make attendance as painless as possible, the seminar operates on a drop-in basis. There is no registration necessary to attend the seminars. Potential attendees are encouraged just to show up. There is also no stigma for arriving late or needing to leave a seminar early. Again, because attendance is voluntary, seminars are kept to about one hour in length. To accommodate most graduate student schedules, the seminars are also given in the early evening, which avoids most of the undergraduate courses and other chemistry department seminars. Because many graduate students cannot make a weekly commitment, the seminars are given biweekly.

The final enticement to encourage attendance is the inclusion of ice cream at the seminars. At each seminar, a cooler is brought to the conference room containing ice cream treats such as ice cream sandwiches, fudge bars, and fruit bars. This also adds to the informality of the situation as attendees will often eat their ice cream and chat before the seminar begins. This reasoning has resulted in one seminar from 5:30-6:30 PM, every other week, during the fall and spring semesters. This allows for approximately 6-7 seminars each semester.

CHOOSING TOPICS FOR THE SEMINARS

The seminars tend to fall into two categories. The first type of seminar is resource-based, focusing on one or two specific databases, websites, or software packages. In these seminars the background of the resource is discussed as well as a general overview of how to use and search the resource. Because the seminars are geared toward the graduate student population, advanced features and search techniques are also demonstrated. The second type of seminar is based on a particular topic or subject, such as searching for spectra or physical properties. In this case, a number of resources could be used to accommodate the information needs of the particular seminar topic. During this type of seminar the speaker details two or three main resources that would be most appropriate for the topic and then also briefly discusses other suitable resources to make the attendees aware of their existence.

The fall semester begins with a number of resource-based seminars to help acclimate the incoming graduate students to the main resources available for searching for chemical information and the chemical literature. Because SciFinder Scholar is the main entry point into the chemical literature via its ability to search Chemical Abstracts and MEDLINE, the first seminar of the fall semester is on SciFinder Scholar. This is also the most familiar database to incoming graduate students. Beginning the seminar series with SciFinder Scholar is also an attempt to make the students more comfortable with the seminar setting. The basics of SciFinder Scholar are briefly discussed, but then the bulk of the seminar is given to highlighting some of the advanced features that are often overlooked (such as the Analyze and Refine features), especially as they relate to narrowing structure and reaction search results. This seminar is also an opportunity to show off any new features that have been added into an upgrade to the software. Because of this dual nature of the seminar, it is often well attended, even by returning graduate students.

The next major set of seminars is a two-part series based on the Beilstein and Gmelin databases via the MDL Crossfire interface. Because of the complex nature of the interface and the wide variety of search functions, the seminar is divided into two parts, one based on text and property searching and another based on structure and reaction searching. The seminars are designed so that one does not need to attend both sessions to understand the basics of each type of search; however, many attendees attempt to attend both seminars.

Rounding out the initial resource-based seminars is one on SPRESI^{web}. SPRESI^{web} is a chemical structure and reaction database created by the German based company InfoChem GmbH that focuses on organic synthesis. This database has some similarities to SciFinder and Beilstein, but because many of the graduate students have never seen this database, it deserves its own seminar. During this seminar there is additional time taken to recapitulate the similarities and differences among, and the pros and cons of, searching the three major resources already covered during the semester: SciFinder Scholar, Beilstein/Gmelin, and SPRESI^{web}.

As the end of the semester nears, the Ice Cream Seminars switch to a relatively new addition to the lineup: EndNote. With the addition of a university-wide site license for EndNote, there has been a sharp increase in the number of EndNote-related questions asked of the library staff. To further promote and support this software, one whole seminar is devoted to EndNote and its interaction with the various chemistry-related databases, as well as its interaction with Microsoft Word to help manage citations in research papers.

The remaining fall and the spring seminars are subject-based and do not necessarily follow any particular order. There is a core list of subject-oriented Ice Cream Seminars that is often given with one or two rotating in or out based on student feedback and demand. The themes of the main subject oriented Ice Cream Seminars follow with brief descriptions:

- **Property searching and data manipulation**—This seminar highlights how to find chemical and physical properties, focusing on electronic resources such as Knovel and the CRC Handbook of Chemistry and Physics. The various methods of manipulating data within Knovel, such as interactive graphs and tables, are also discussed.
- **Patents and intellectual property**—The concept of patents is discussed along with multiple ways to search the patent literature via SciFinder Scholar and the online databases of the United States Patent and Trademark Office and the European Patent Office. A brief introduction to patent classifications is given. Also, unique issues related to chemical patents such as how chemical structures are represented (for example, using Markush Structures and Variable Points of Attachment) are introduced. Finally, trademarks are mentioned as they relate to chemical trade names, especially pharmaceuticals.
- **Spectra**—This seminar covers the major free online databases that allow for spectra searching as well as covering the same features found in licensed databases such as Beilstein and SciFinder Scholar. Because spectral data is spread across many resources, a number of print resources are also discussed.
- **Citation searching**—In this seminar, citation searching is defined and demonstrations are given regarding the overlap and uniqueness of using SciFinder Scholar, Web of Science, and Google Scholar for citation searching. In addition, the Journal Citation Reports are also covered in this class, focusing on the concepts of impact factor and immediacy index, and how they are calculated.
- **Current awareness services**—In this seminar two types of current awareness services are discussed: those in which you create a general keyword or similar search alert in a particular database and those that are narrower or focused on just one or two specific journals, such as a table of contents alert. The pros and cons of relying on search alerts

are also discussed.

- **Non-traditional sources of information**—This Ice Cream Seminar first briefly introduces attendees to such concepts as grey literature, invisible Web, open access and institutional repositories. Next, non-traditional sources of information such as dissertations, conference proceedings, technical reports, and standards are discussed as well as typical methods of searching for these categories of information.
- **Chemistry and biology**—Covers resources related to the interface of chemistry and biology. The major literature databases related to biology are demonstrated, such as Biological Abstracts. The other portion of the seminar deals with bioinformatics and chemistry, in particular resources at the National Center for Biotechnology Information (NCBI) and European Bioinformatics Institute (EBI) websites. PubChem is also discussed. Only the basics can be covered in an hour for this particular topic, but it is meant more as an awareness seminar—gathering interested parties and making them aware of resources for them to explore and try out for their own research needs.

In addition, for special occasions or as a result of seminar evaluations, additional seminars are given on specific topics. Two such examples include:

- **How NOT to give a presentation**—Focuses on best practices in designing a Microsoft PowerPoint presentation as well as positive public speaking habits and tips for a successful presentation.
- **SciFinder in industry**—For this seminar, our SciFinder Scholar representative came to campus to give this seminar about the version of SciFinder available in industry and how it differs, sometimes dramatically, from SciFinder Scholar. This seminar was intended to make graduate students more aware of the resources that might find in industry after

graduation.

Additional seminars can be given if new resources are acquired or there are significant changes to an already existing resource such as new features or a new interface.

CREATING CONTENT FOR THE SEMINARS

Upon taking over the management of the Ice Cream Seminars in the fall of 2004, the author implemented some significant changes to the organization of the seminars by creating a binder system and informational cover sheets for each seminar.

At the first two or three seminars of each semester, first time attendees are given a one and a half inch three-ring binder. The binder has clear covers with a copy of the semester's seminar schedule placed in the front cover, while the spine indicates the binder contains information from the Chemistry Library Ice Cream Seminars. The handouts for all of the seminars have been hole-punched and can be stored within the same binder. It is hoped the binder serves a number of purposes: Immediately, it indicates to the attendees that the Chemistry Library is serious enough about the seminars to provide them with a binder and to go to the trouble of organizing the handouts. This catches the students' attention and many indicate their appreciation once they realize the potential for collecting as many seminar handouts as possible. The size of the binder also will mean it is less likely to be misplaced, making it easier to find when needed for consultation. Finally, for those that do attend most of the seminars, the full binder provides a mini-ready reference collection on the most frequently used resources and topics. It is suggested at the first few seminars that students place the binder in their office or research labs so that the entire research group, both new and experienced, can benefit from the enclosed documents.

The initial handout for every seminar is a cover sheet. The cover sheet is based on a similar document utilized by Purdue University's Center for Instructional Excellence for their College Teaching Workshop series. The structure of the cover sheet is the same for each seminar, so that attendees can quickly look at the cover sheet and gain the same amount of information on the seminar, regardless of the topic. The cover sheet has five sections:

- Title of Seminar along with name and contact information for seminar presenter
- Description of the seminar
- Expectations of the seminar
- Specific questions to be answered in the seminar
- Suggested readings and websites for additional information

In three to five sentences, the description of the seminar explains the types of resources or topic covered as well as reasons why someone might want to attend the seminar. This section is mainly used for marketing the seminar before it actually occurs, as will be discussed in the Marketing section. For example, the Description section for the initial seminar on SciFinder Scholar might state:

SciFinder Scholar is a very powerful resource, and there are many (sometimes hidden) features and pathways within the program. This seminar will provide you with some interesting and important strategies for searching SciFinder Scholar. You will see some of these approaches in action and hopefully there will be time for sharing your own tips with the rest of the group.

The next section details the expectations of the seminar. It briefly states what attendees should take away from the seminar, and gives further justification for attending the seminar.

A typical Expectations section for a SciFinder Scholar seminar might read:

In this seminar you will learn some basic strategies for using SciFinder Scholar in new and powerful ways. It will also provide you with supplemental tricks to use so you can be as comprehensive in your day-to-day searches as possible. Because we only have seven simultaneous users, it is important to make the most of your time when searching SciFinder Scholar. And in industry where SciFinder is even more expensive, it pays to become a better searcher now!

The next section includes specific questions that the attendees should be able to answer after attending the seminar. This section takes the previously stated expectations and enumerates them in more detail. Typical questions from the SciFinder Scholar seminar:

- What are the various components (databases) that make up SciFinder Scholar?
- How do I access SciFinder Scholar and how does that affect my searches?
- What are some nuances in the Author and Research Topic searches I can use to maximize my results?
- How can I retrieve full-text information from multiple articles at once?
- When might I want to change the default preferences?
- How can I use the Analyze feature to show hidden trends in my results?
- What are my various options to Analyze and Refine a reaction or substance search?

The final section includes appropriate suggested readings and websites for the seminar. Typical items listed may be a book or article further detailing the resource or subject, URLs for support or tutorials on a particular topic, or important URLs on the Chemistry Library website.

The cover sheet is kept to one page and is printed on different colored paper for each seminar. This way the cover sheets also act as dividers in the binder when placed with other seminar documents. Along with the cover sheet, the attendees are given any other additional handouts for the seminar upon entering the room. Almost always this includes the PowerPoint presentation that will be given, but may also include other documents as well, such as details of sample searches, a list of practice problems, or an annotated bibliography of additional resources. All documents are hole-punched for ease of storing within the binder.

MARKETING THE SEMINARS

Because the content of the seminars is focused on chemical information resources (not just chemistry resources), the seminars are marketed to the chemistry department and any other relevant departments that would have interest in the resources and topics being taught. The most heavily targeted departments outside of chemistry include chemical engineering and pharmacy, but there is also some exposure within other science and engineering disciplines such as food science, life science, and physics. While the focus of the seminars is to cater to the needs of new graduate students, the seminars are marketed to all graduate students and faculty of appropriate departments. With the acquisition of new resources or changes in interfaces or access, it is important to offer opportunities to all patrons who may have use of the particular resources discussed at the seminar. A variety of marketing methods have been implemented since the inception of the Ice Cream Seminars.

A support staff member in the chemistry library assists the chemistry librarians with designing 8 by 11 inch posters in Microsoft Publisher. For each semester, one poster is created with the full schedule and then a poster is created for each individual seminar. The

posters include the title of the seminar, speaker information, and the date, time and location of the seminar. Posters are created with colorful, eye-catching graphics and text. Though poster designs vary, there is some consistency with a border around each poster indicating it is associated with the Ice Cream Seminars. Color copies of the poster are made and they are then placed in strategic areas on campus the week before each seminar. In the chemistry library the posters are placed outside the library near the entrance, near the photocopiers, at the top of each stairwell on each floor, and in similar high traffic areas. Outside the library, but still within the chemistry building, the posters are put up in a display case owned by the chemistry library, on public bulletin boards in the hallways, and near the graduate student mailboxes. Finally, the posters are also converted to PDF format, and e-mailed to the librarians of the other science and engineering libraries so they may be posted in those libraries as appropriate.

Electronic marketing offers more avenues for advertising the seminars. The aforementioned PDF files can be sent to various distribution lists, including those devoted to entire departments, or only to faculty or to graduate students. The week before the seminar, the seminar speaker directly e-mails the graduate student listservs for chemistry and chemical engineering including the Description and Questions to Be Answered for that particular seminar. The reason for including this information is to give the graduate students enough information on the topics and resources covered and the level of content (basic, intermediate, or advanced) to be able to decide if it is in their best interest to attend. In the chemistry department there is also a public calendar listed on the website that includes information on all departmental seminars. The Ice Cream Seminars are included on this public calendar, which places them on the same level as the other seminars within the department. From this calendar, the department creates a “This Week in Chemistry” document of all of the events for the coming week and this PDF is e-mailed to all members of the department—faculty,

staff, and graduate students. In this way, most members of the chemistry department are in some way made aware of the seminars.

For additional exposure, the Ice Cream Seminars have their own web page linked from the Chemistry Library homepage. This page includes the full schedule for the semester and the notes and handouts for the semester's seminars within a week after they have been presented.

Finally, the seminars are mentioned wherever there is an appropriate opportunity. The seminars are advertised at orientations for new graduate students at the beginning of the fall semester and mentioned as additional learning opportunities in classes the chemistry librarians teach, whether in chemistry or other related departments. The seminars are even mentioned to visiting prospective graduate students each spring.

EVALUATION OF THE SEMINARS

In terms of attendance, the Ice Cream Seminars have been successful. Over the past two academic years, 267 people have attended 22 seminars and the average attendance per seminar has been 12 attendees, with nearly all of them graduate students. Fall semester seminars tend to have greater attendance than the spring semester. As stated previously, the fall seminars cover the larger, more well-known databases related to chemistry. The seminars in the spring are more topical and may not interest all graduate students. For example, most graduate students have some interest in more universal topics such as SciFinder Scholar and EndNote, but fewer would be interested in resources related to bioinformatics or spectra.

Because attendance is voluntary and students may attend as many or as few of the seminars as they wish, evaluation of the Ice Cream Seminars is difficult. There is little consistency in attendance between seminars, making it difficult to track any one attendee's

progress, and because the seminars are not associated with any particular class, no specific outcomes on exams or final projects can be assessed. Instead, immediate feedback on the particular topic and seminar is gathered anonymously. At the beginning of each seminar, each attendee is given a short evaluation form which can be filled out at the end of the seminar. There are four evaluative questions and two open ended questions. The first question asks the attendee “Overall I would rate this seminar as” with choices of excellent, very good, good, fair, or poor. The next three questions can be answered by the choice of: strongly agree, agree, uncertain, disagree, or strongly disagree. The three questions are:

1. I can apply information/skills learned in this seminar to my work/research
2. The format of this seminar was appropriate for the seminar purpose
3. I felt free to ask questions in the seminar

The two open ended questions are “What I liked best about this seminar was...” and “This seminar could be improved by...” The average rate of return of the evaluation over the last two academic years is 73%.

Overall, attendees are very pleased with the seminars as a whole, with the average rating of the seminars being “very good.” The responses to the other three evaluative questions are skewed even higher with average ratings closer to “strongly agree.” Because the evaluations have been so positive and consistent over time, more attention has been paid to the responses to the open ended questions. While the mechanics of the seminar are rated highly, such as the informal atmosphere and the general content of each seminar, there are specific details that a number of students feel could further improve the seminars. A number of students request a hands-on setting, while others that realize this might not be a viable option ask for the next best thing—sample exercises. Therefore, for certain seminars, an extra hand-out of

additional problems has been created. The attendees can then take away these exercises and attempt them on their own at a later time.

An additional question added to the evaluation form for the 2005-2006 academic year asked the attendee to indicate their faculty research advisor. Gathering this information gave some idea of how widespread attendance of the seminars was among various research groups, especially in the chemistry department. The additional hope was to see how many students were coming from departments outside the chemistry department. While not everyone indicated their research advisor, there was at least one attendee from 13 unique research groups in the chemistry department. This represents 30% of the 43 research groups currently active in the department. Unfortunately, there were no indications of research groups outside the chemistry department, indicating the need to be more proactive in marketing the seminars to other departments. This has been a perennial problem with the seminars because they take place in the same building as the chemistry department; therefore the most likely attendees are chemistry graduate students. The buildings housing departments of pharmacy and chemical engineering, while not far away, can still be seen as an “inconvenient” hike across campus to reach the chemistry building, preventing further participation from graduate students in those disciplines.

Tracking various groups represented and casual conversations with students before each seminar have also led to collaborations with particular research groups. It was found that in some research groups, a graduate student would attend the seminar and then report back to their entire research group. This could take the form of a simple write-up, making additional copies of the seminar hand-outs for the rest of the group, or the student presenting what they learned in the seminar to their research group. Some research groups have also asked for a customized seminar specific to their research group.

FUTURE DIRECTIONS

The continual problem faced each academic year for the Ice Cream Seminars is to consider what format is most appropriate. Because many students indicate they want hands-on experience, this request would require evaluating the implications of changing the current format. If the seminars were to take place solely in a computer lab, it could be difficult to finish the seminar in under an hour because extra time would need to be allocated for hands-on work and for troubleshooting individual problems during the seminar. To compensate, one would have to consider if increasing the time allotted for each seminar would impact attendance and if seminar content would have to be abridged. Another possibility would be to start a lecture in the conference room, allowing for the ice cream to be served and a brief informal conversation on the particular seminar topic. Then the group could move to a computer lab for the hands-on portion of the seminar. Again, this would require additional time to transfer between rooms, compromising the efficiency of the seminar. Another possibility would be to provide a small number of laptops to attendees to use during the seminar in the conference room. This would require additional money to purchase library laptops as well as time to maintain them (loading software, recharging batteries, etc.). At this time there are no plans to go toward a more hands-on format, though there may be some experimentation with the format as a way to solicit additional feedback.

Another issue is whether to create a registration or sign-up system for the seminars. This might increase attendance and create greater accountability for those who indicate an interest in attending. With the current acceptable levels of attendance, there is no urgent need for such a system. Part of the success of the seminars is based on their informal nature.

Continuing to target relevant departments outside of chemistry will continue to be a challenge. Actively marketing the seminars at orientations and other face to face meetings is

important for increasing attendance from other departments. Repeating some of the seminars in the buildings that house other departments such as chemical engineering and pharmacy has been discussed, but has not been implemented. This issue may have to be revisited.

As always, new topics and resources will be sought out as potential seminar topics. This will allow the seminars to remain innovative and attract attendees who may not have considered previous topics relevant. New topics under consideration include ones focusing on computational resources like ChemDraw and E-Notebook from CambridgeSoft and seminars on interdisciplinary resources between the fields of chemistry and physics or nanotechnology. Further collaborations with other librarians and obtaining additional guest speakers would further expand the scope of the Ice Cream Seminars. There has been success at Northwestern University with collaborations among subject faculty and IT staff in a similar situation (Lightman & Reingold, 2005).

Finally, developing an official credit course at the graduate level, whether required or not, could reach a greater number of graduate students in a variety of disciplines. Other institutions have successfully implemented such a course (Currano, 2005; O'Neill, 1993; Smith, 1993). Similarly, an achievement by Somerville and Cardinal (2003) has been to fully integrate chemical information instruction throughout the curriculum ranging from a general chemistry course with 400 students all the way through to advanced chemistry courses designed for upper-class undergraduate students and graduate students.

CONCLUSION

Overall, attendees consistently rate the seminars between “very good” and “excellent” while satisfaction with knowledge gained and format of the seminars is also extremely positive. Characteristics contributing to this success include:

- Offering an incentive for attendance such as ice cream
- Offering seminars on a regular basis to establish a presence within the department(s)
- Adding variety by covering both specific resources and diverse topics
- Creating an informal atmosphere during each seminar
- Offering an organized handout system to place further emphasis on information taught
- Making sure attendees know ahead of time the detailed content of the seminar in order to make an informed decision on whether to attend or not
- Marketing through as many venues as practical
- Monitoring attendee satisfaction by regularly evaluating and soliciting for feedback

Attendance will still need to be encouraged, especially to departments outside chemistry. The Ice Cream Seminars were created to level the playing field for graduate students from varying backgrounds to succeed in their library research. The continual evaluation and adaptation of these seminars indicates that for a great number of graduate students, they are serving their purpose, although there is always room for improvement.

REFERENCES

- Ackerson, L. G. (1996). Basing reference service on scientific communication: Toward a more effective model for science graduate students. *RQ*, *36*, 248-260.
- Bradigan, P. S., Kroll, S. M., & Sims, S. R. (1987). Graduate student bibliographic instruction at a large university: A workshop approach. *RQ*, *26*, 335-340.
- Carr, C. (1993). Teaching and using chemical information: An updated bibliography. *Journal of Chemical Education*, *70*, 719-726.
- Carr, C. (2000). Teaching and using chemical information: Annotated bibliography, 1993-1998. *Journal of*

- Chemical Education*, 77, 412-422.
- Committee on Professional Training. (2003a). *Chemical information retrieval*. Retrieved September 19, 2006, from http://www.chemistry.org/portal/a/c/s/1/acdisplay.html?DOC=education\cpt\ts_cheminfo.html
- Committee on Professional Training. (2003b). *Undergraduate professional education in chemistry: Guidelines and evaluation procedures*. Washington, DC: American Chemical Society.
- Currano, J. N. (2005). Learning to search in ten easy steps: A review of a chemical information course. *Journal of Chemical Education*, 82, 484-487.
- Dreifuss, R. A. (1981). Library instruction and graduate students: More work for George. *RQ*, 21, 121-123.
- Drum, C. A., Primack, A. L., Battiste, A., & Barratt, E. (1993). Library instruction for chemistry students: A course-integrated approach. *Science and Technology Libraries*, 14(2): 79-88.
- Hostettler, J. D., & Wolfe, M. B. (1984). A brief introduction to the chemical literature with a bibliography and exercises. *Journal of Chemical Education*, 61, 622-624.
- Kazlauskas, D. W. (1987). *Bibliographic instruction at the graduate level: A study of methods*. Jacksonville, FL: University of North Florida. (ERIC Document Reproduction Service No. ED 311932)
- Korolev, S. (2001) Chemical information literacy: Integration of international graduate students in the research. *Science and Technology Libraries*, 19(2): 35-42.
- Lawal, I. O. (2001). Integrating chemical information into the undergraduate curriculum: Information literacy and a change in pedagogy. *Science and Technology Libraries*, 20(1): 43-58.
- Lightman, H., & Reingold, R. N. (2005). A collaborative model for teaching e-resources: Northwestern University's Graduate Training Day. *portal: Libraries and the Academy*, 5, 23-32.
- Matthews, F. J. (1997). Chemical literature: A course composed of traditional online searching techniques. *Journal of Chemical Education*, 74, 1011-1014.
- Michalak, T. J. (1976). Library services to the graduate community: The role of the subject specialist librarian. *College and Research Libraries*, 37, 257-265.
- O'Neill, P. E. (1993). Instruction programs for graduate students—Two different programs. In *Abstracts of Papers, Part 1*, 206th National Meeting of the American Chemical Society, Chicago, IL., Aug 22-27, 1993 (CHED 93). American Chemical Society: Washington, DC.
- Smith, A. L. (1993). A graduate course in chemical information. In *Abstracts of Papers, Part 1*, 206th National Meeting of the American Chemical Society, Chicago, IL., Aug 22-27, 1993 (CHED 74). American Chemical Society: Washington, DC.

Somerville, A. N. (1990). Computer searching of chemical databases by faculty and students at the University of Rochester. *Science and Technology Libraries*, 10(2): 67-97.

Somerville, A. N., & Cardinal, S. K. (2003). An integrated chemical information instruction program. *Journal of Chemical Education*, 80, 574-579.