
AC 2011-68: SCIENCE AND ENGINEERING LIBRARY - ACCESSIBLE TO INNER-CITY COMMUNITIES THROUGH SCIENCE 101

Aleteia Greenwood, University of British Columbia

Aleteia Greenwood is Head Librarian, Science & Engineering Library at the University of British Columbia. She is also student, faculty and collections development liaison to the Civil and Mechanical Engineering Departments.

Eugene Barsky, University of British Columbia

Eugene Barsky is a Science and Engineering Librarian at the University of British Columbia (UBC). Published extensively in the library science literature, he also is the winner of 2007 Canadian Health Library Association 'Emerging Leader' award and 2007 Partnership award from the Canadian Physiotherapy Association.

**Science and Engineering Library - Accessible to Inner-City
Communities through Science 101**

Abstract

Science 101 is a course at the University of British Columbia (UBC) that provides an introductory science education in physics, astronomy, chemistry, computer science, earth and ocean sciences, and biology for individuals who historically have had difficulty accessing a university education. For the last ten years, two UBC engineering librarians have been working with this class to offer library workshops to Science 101 students, focusing on the world of scientific information: how to approach it, how to find academic research papers and books and how to evaluate the science information students find online. This paper describes the community of students the librarians work with when teaching Science 101, the ever-changing methods the librarians use to engage these students and what the librarians have learned working with this group of students. Also described are specific exercises librarians use to make the sessions more interactive and engaging, such as how to make a poster, how to write an abstract, how to evaluate resources in print and online.

Introduction

University-sponsored summer science courses for inner city residents are certainly not a new idea. However, the majority of these courses have been focused on preparing high school students for science courses¹⁻³ and on resources to support the teachers that instruct these students⁴. Usually, these courses focus on introducing basic scientific concepts and laboratory skills. Many formal adult education programs exist (i.e. continuing education) that are committed to a formal agenda (i.e. a diploma or degree). If there are programs offered that provide access to the academic institutional approach to teaching and learning for underprivileged/disadvantaged/inner city adults they are not well advertised.

Background

The Science 101 course at the University of British Columbia provides an introductory science education in physics, astronomy, chemistry, computer science, earth and ocean science, and biology for individuals who have historically had difficulty accessing a university education⁵. This is a free four-month, non-credit course offered to residents of Vancouver's Downtown Eastside and other inner-city communities, and no pre-requisite knowledge is required. Inspired by the success of Humanities 101^{6,7}, Science 101 began in 2000, with an average of 25 students attending per year. Originally "funding for the program came from the UBC Alma Mater Society's Innovative Projects Fund, the President's Office and the Society for Canadian Women in Science and Technology."⁸

How Librarians Got Involved

Over the course of the past ten years, two UBC engineering librarians have worked with this class to offer library workshops to Science 101 students. Involvement in the course began with a chance meeting with the then-coordinator, Charly Bank, who was

coordinating Science 101 in its 2nd year. One of the authors worked with the almost annually changing coordinators for eight years, until she changed jobs, whereupon the other author took over as liaison to Science 101. The librarians have provided library information sessions that include how to search the catalogue, how information is organized, and how to evaluate resources. The presentation has transformed over the years, influenced by the volunteer coordinator who changes each year, the librarians, and their particular knowledge and skill strengths, and the ever-changing access to resources.

Developing Library Instruction

From the very beginning the librarians worked with course coordinators to decide how much and what kind of information the students needed. They knew some students would be familiar with public libraries and some could be familiar with the UBC Library system if they had previously taken Humanities 101. The 2nd year coordinator's initial passion and interest in making an accessible course helped to shape the approach the librarians took with each subsequent class as the years passed. In meetings to plan the library's presentation each coordinator has brought their own knowledge and enthusiasm which has also helped shape the library presentation.

The very first library workshop in 2001 was given in a classroom, with a combination of lecture and hands-on activity. The librarian demonstrated how researching a topic was different based on whether students used the UBC catalogue, journal indexes or the Internet. She included a process to help the students start their research with an academic paper, and discussed the differences between primary and secondary sources. She focused on how to find information on topics gleaned from the course curriculum, such as tsunamis, volcanoes, supernovae, and glaciers and demonstrated how to find these topics in encyclopedias and handbooks as well as how to find videorecordings, books and journal articles on these topics. The library presentation was followed by a treasure hunt in the Main Library, where the science and engineering books were held, in which students were put in groups of six, and given a more focused topic such as, tsunamis - hazards; volcanoes - Mt. St. Helen's; and glaciers and climate. In their groups students had to find an encyclopedic entry, a book and a journal article. The librarian and volunteer student tutors assisted Science 101 students with using the catalogue and databases.

From 2002, library workshops were held in a computer lab; this provided an opportunity for all students to have hands-on experience with library resources. During those years, it was decided by each coordinator and librarian that database demonstrations were not necessary for this presentation because that would occur when students requested further assistance from the librarian. The presentation has consistently included searching the catalogue for books and videos by author, title, keyword, and subject. In addition, the librarian added an explanation about what Google is and demonstrated how to do effective Google searches, along with how to evaluate resources found on Google. Practice searches were introduced to replace the treasure hunt of the first year and are tailored to the course curriculum as well as influenced by hot and current topics in science research. The library demonstrations and the practice searches continue to be

informed by the topics covered in the curriculum. For example, this past year the librarian used the topics: planets and exploration, planets and observation, black holes, global warming, genetic engineering, and Alzheimer's.

Since every year the content of this course changes slightly, and new coordinators come with new ideas, the librarians and course coordinators meet regularly to discuss curriculum changes and to tailor the library presentation to address the students authentic needs to complete the course requirements. For example, during the last three years, the librarian began to incorporate more powerful searching techniques, such as Google commands into his workshops (e.g. intitle:), to help participants better utilize the power of search engines. Increased online access to resources has also affected the presentation so that the librarian now focuses on how to locate and search two specific journals available online, *Science* and *Nature*, rather than demonstrating how to search a database in order to find articles in those particular journals. The library presentation also includes more information on how the public library and university library are similar, and different. Many of the students in Science 101 are already library users so the librarians have tried to capitalize on the students' knowledge and create a connection between how similarly the libraries operate, and how similarly information is organized and described in libraries in general. The librarians work closely with course coordinators to make library presentations dynamic and well-connected to the students' real needs: their weekly assignments, paper abstracts and posters.

Presentation Materials

The course subject guide ⁹ is designed to help the students with their weekly assignments. It includes all the resources demonstrated in the library presentation as well as additional links that will assist with completing assignments. Librarians have also created a variety of activities such as a list of movies about science and scientists ¹⁰ in order to grab the students' interest, and a handy online Search Strategy Worksheet ¹¹ that helps students visualize and think about how to create an effective search strategy. The presentation includes an in-depth discussion about Plagiarism, and the course guide includes a link to a UBC Library tutorial about this subject ¹². How to evaluate the information students find online is also covered and the course guide includes a link to an evaluation tool ¹³ created by one of the authors that uses questions and examples to help students be critical consumers of information. All this, while trying to make it fun and easy. The approach seems to work as students participate, ask many questions, and share their ideas.

Challenges

The library session is a one-shot, three hour evening session so the messages presented must be dynamic, short, and to the point. The librarians must have the ability to respond to a range of motivation as well as learning styles in the class. Some students are interested and enthusiastic about learning how to do library research, some are overwhelmed and distracted, and some seem to be present primarily for the social aspect. It is a challenge to reach all of them on their particular levels. The librarians must be able to work with students who have a range of computer skills. Some of the students are very

comfortable with computers, some are beginners and require additional help. It is necessary to have a number of student volunteers to help the Science 101 students through the library presentation so those less familiar with how to use computers are able to successfully partake in learning how information is organized. Because the librarians have one shot at this class they do not have the opportunity to revisit the class, ask for feedback and allow students to reflect on their experience. However, the librarians always make themselves available for Science 101 students and generally about a third of them contact the librarians every year with follow up questions and comments.

Why Are Librarians Involved With This Class?

The librarians believe that the presence of libraries in this class' curriculum expands the students' knowledge base in the sense of understanding that they are welcome to the campus and should avail themselves of the services available. Since the library represents access to information the work librarians do with this class can help the students feel accepted into the world of engaged learning and appreciative inquiry, a world that they may not have had access to without this course. The work the librarians do also facilitates exposure to the world of science and engineering libraries and information by exposing students to how information is organized and accessed, and showing students techniques for evaluating information. Working with this class is also personally rewarding because of the students' genuine enthusiasm and interest in being exposed to the academic world.

Conclusion

The librarians find it exciting and rewarding to have the opportunity to give bibliographic instruction to a group of people who often come from very diverse backgrounds than the students who they usually teach to. Science 101 students are diverse in age and ethnicity, but they have in common an enthusiasm that simply exudes from them. They are very bright, but many are not familiar with how a library works or information is organized, and many are unfamiliar with computers and uncomfortable because of this. Politeness, warmth and humour have served the librarians well. They have attempted to create presentations that would grab and hold the interest of people with a variety of attitudes and experiences that, in some cases, had little or nothing to do with academic learning. They have had to pay attention to the fact that Science 101 students' experiences, though not necessarily academic, are wide-ranging and informative in a way that academic learning may not be. They have striven for an attitude that is neither condescending nor overwhelming. The students always have an immense amount of enthusiasm for the demonstrations, activities and support the library has provided. The librarians found a perfect summary in the comments from James Dennis, a graduate of Science 101, when asked about his thoughts on the library's involvement with the class:

I have to say the best thing I received from the lecture and the on-going support/access was the fact that it made one more major resource of one of Canada's largest universities more accessible and less frightening. I know that may sound sort of strange, but when

you spend enough time on “the wrong side of the tracks” you can come to believe that a place like UBC and its buildings are for the rich, smart people, and that you neither belong there nor are welcome there. I think you were great in breaking the ice and letting me know the Library was for everyone.

You can give a man a fish and he will eat for a day

or

You can teach a man to fish, and he will eat forever

or

While teaching him to fish, he may discover his love of boats and boatbuilding,

become a master boatbuilder and be able to buy his fish.

Moral of the story: You can never tell what will grow (like a beautiful friendship) when you share the seed of knowledge.

References:

1. Davis SF, McEntire JC, Sarakatsannis J. Fostering an interest in science in a typically underrepresented population. *Journal of Food Science Education*. 2007;6:14-16.
2. Niemann MA, Miller ML, Davis T. The University of Alabama at Birmingham Center for Community OutReach development summer science institute program: A 3-yr laboratory research experience for inner-city secondary-level students. *Cell Biology Education*. 2004;3:162-180.
3. Sticht TG, McDonald BA, Erickson PR, San Diego Consortium for Workforce Education and, Lifelong Learning. Passports to paradise: The struggle to teach and to learn on the margins of adult education. 1998. Available from:
<http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED418238&login.asp&site=ehost-live>.
4. Sabella MS. Providing support to inner-city students and teachers through the physics van inservice institute. *Physics Teacher*. 2007;45:80-84.
5. Science 101. Teaching Science in the Community: Science 101. Available at:
<http://www.science.ubc.ca/support/community/101>. Accessed 3/4/2011.
6. Bula F. 101 class enriches poorer students: UBC program brings classics, sciences to low-income people in downtown eastside. *The Vancouver Sun*. Aug 20 2001:B.1.FRO. Available from:
<http://proquest.umi.com/pqdweb?did=225012161&Fmt=7&clientId=6993&RQT=309&VName=PQD>.
7. Humanities 101. Humanities 101, UBC Faculty of Arts. Available at: <http://humanities101.arts.ubc.ca/>. Accessed 3/4/2011.
8. UBC Public Affairs. Science 101 opens doors. Available at:
<http://www.publicaffairs.ubc.ca/ubcreports/2000/00aug10/science101.html>. Accessed 3/9/2011.

9. Barsky E, Greenwood A. Science 101 Course Guide. Available at: <http://toby.library.ubc.ca/ereserve/er-coursepage.cfm?id=1782>. Accessed 3/4/2011.
10. Greenwood A. Movies about science and scientists worksheet. Available from: <http://branchscieng.sites.olt.ubc.ca/files/2011/01/movies.doc>. Accessed 3/4/2011.
11. Greenwood A., Stein D. Search strategy worksheet. Available from: http://branchscieng.sites.olt.ubc.ca/files/2011/01/Search_Strategy_Worksheet.doc. Accessed 3/4/2011.
12. UBC Library. Academic integrity resource centre. Available from: <http://learningcommons.ubc.ca/get-study-help/academic-integrity/>. Accessed 3/4/2011.
13. Greenwood A. Evaluating internet sources. Available from: <http://help.library.ubc.ca/researching/evaluating-internet-sources/>. Accessed 3/4/2011.