

UT Library Directors' Award for Excellence in Library Resource Integration

Nomination Form - Nominations must be submitted by April 13, 2007.

Faculty Information

Faculty Name: Cynthia Ledbetter & Rebekah Nix
UT Campus: Dallas
Email Address: rnix@utdallas.edu
Daytime Phone: 972-883-2488

Person Submitting Nomination

Name: Rebekah Nix
Title: Senior Lecturer
Email Address: rnix@utdallas.edu
Daytime Phone: 972-883-2488

Course Information

Course Title: SCE 5305: Evaluating Research in Science Education (OT1)
Delivery Method of Course: Online (Delivered entirely online)

Library and Information Literacy Integration

Please check all that apply.

Students were informed of library services available to them.

In order to truly integrate the library into our course, we used a variety of methods to inform - and remind - students about UTD and UTTC library resources. An external link to the UTD Library homepage was added to the course menu to allow for easy access and to serve as an ever-present hint to go there. Separate sections in our publicly-available program guide ([MAT-SE Online! Basics](#)) detailed available resources and login procedures for UTD's McDermott Library and UTTC's Digital Library resources. Specific project and assignment tasks to check library access and basic skills were listed in the course schedule and throughout the lesson pages as appropriate. The 'getting started checklist' for this course (available in the SciEd@UTD organization) included accessing the UTD and UTTC Digital Libraries. Our departmental library liaison was listed as a course consultant on the instructor page, providing ready details on how to contact her via email or telephone along with a direct link to her staff website. Strategically timed announcements tied to lessons helped to inform students of the library services available to them, i.e. tutorials and databases, hints on finding articles faster, tips on identifying scholarly articles, ways to get to the assignment articles, and ideas for keeping up with the current research.

Students developed library or information research skills in course.

The goal of this course is to familiarize students with research in science education, so students learned and practiced library and information research skills throughout the semester. Students were required to appropriately search the current body of literature, critically evaluate relevant research documents, and formulate an independent research plan based on a formal review of literature. A *Midterm Project Summary* was scored by the instructor in week 7. Students downloaded, completed, and returned a Microsoft Word form to summarize their literature review and six primary source research reports. Students also wrote a research goal and purpose and chose 5 keywords to describe the context of their selections. This task demonstrated their ability to select and evaluate and cite research reports independently. To assist students with their literature review project development, a dedicated discussion forum was moderated by the library liaison during the semester. Structured threads included: Who is your UTD Librarian Liaison?, DIGITAL LIBRARY vs THE INTERNET, IMPROVING SEARCH STRATEGIES, IDENTIFYING PRIMARY RESEARCH, EVOLVING KEYWORD TACTICS, and GENERAL

UT Library Directors' Award for Excellence in Library Resource Integration

Nomination Form - Nominations must be submitted by April 13, 2007.

RESEARCH COMMENTS. An added bonus was that the faculty advanced their own professional development as new resources, tools, and techniques were explained by the liaison!

Assignment(s) incorporating library resources were integrated into course.

To gain experience in understanding and applying critical library and research skills, students retrieved, read, and evaluated ten *research articles* within the genre of science education research. These complete/incomplete assignments were delivered as 'quizzes' to provide immediate feedback to students as they progressed at their own pace within each lesson. Building on Ledbetter's 20+ years of experience, the amount of detail decreased as the level of knowledge and breadth of guided practice increased over time. Other tasks also integrated library resources as appropriate to the content. For example, students were directed to take a virtual tour of UTD's McDermott Library, to introduce themselves to the Science Education Reference Librarian, to work through custom tutorials on the liaison's webpage and general help tools on the library and database websites, and so on. The dedicated discussion forum, led by the liaison, served as a clearinghouse for frequently asked questions and new approaches to conducting literature searches, generating keyword lists, identifying primary sources, citing references, reviewing commonly-used data collection instruments, and so on. For example, project task #4 focused on setting research goals. Students generated a list of 5 keywords that they might search on to address a particular aspect of their top 3 teaching concerns (posted earlier in a different discussion). After running several searches individually, small teams synthesized a list of identifiers of primary research. A brief summary of how the exercise helped improve research techniques within each group was shared in the librarian's discussion forum for class review.

Assignment(s) addressed information literacy skills (for example: identifying an information need, accessing resources, evaluating information, integrating information, or the ethical use of information).

Critical for success in SCE 5305, information literacy skills were addressed in each lesson. For example, the *Literature Search* workgroup interaction in week 3 required students to decide on a search strategy to find a good research article that contrasts the lecture mode of teaching with hands-on teaching and student achievement. They then tested that strategy in at least 3 different search engines, compared the results, and brainstormed ways to improve their initial search strategy to return additional or better results. Each team's insights were shared in the library liaison's discussion forum for further expert comment. Later, in week 8, students posted a summary of how their new team's keyword lists had changed generally as their research topics developed over time and with their new experience and knowledge. Due to the intensive nature of the course content, specific textbook readings were assigned to provide fundamental information on research types, methods, and ethics, and writing genre. Ten *Textbook Reading Quizzes* were administered on a weekly basis. A variety of question formats (i.e. multiple choice, true/false, matching, ordering, and fill-in-the-blank) were used to assess student knowledge and application of that knowledge, as well as the ability to evaluate specific case studies.

Assessment(s) tested students' comprehension of information literacy skills.

Developed over the full semester through specific tasks, three final projects required students to demonstrate their ability to produce scientifically rigorous evaluations of studied interventions and published research. The *Literature Review Paper* was evaluated on overall content, writing style, and editing. The *Persuasive Presentation* was evaluated on professionalism, content, design, format, and style. At least six primary source research articles were to be reviewed and used effectively to support the overall content of the paper and presentation. The *Research Study Proposal* was evaluated on introduction, methods, and conclusions. Students downloaded, completed, and submitted a Research Study Proposal form using the assignment option. Based on

UT Library Directors' Award for Excellence in Library Resource Integration

Nomination Form - Nominations must be submitted by April 13, 2007.

the university's Institutional Review Board form (which incorporates the ethical requirements of the National Institutes of Health), this document was designed to serve as a critical guide for the next required research course in the sequence. Items included the title, rationale, purpose, goals, sample, expected outcomes, proposed methods, data collection and analysis, and anticipated impact. The accepted standard for most science education journals and subsequent research at the university, the American Psychological Association (APA) style guidelines were used to objectively compare the content and structure of all student work.

Also noteworthy is that a composite survey was created to allow students to self-report on their level of resource literacy (as defined by Shapiro and Hughes in 1996). Administered in the final week of the course, the *Resource Literacy Questionnaire* specifically addressed student perceptions of efficacy, attitude, and abilities, as well as the course learning environment. Approved by the Literatures in English Executive Committee of the American Library Association, the seven efficacy items were adapted from the Research Competency Guidelines for Literatures in English to reflect the key activities required to identify and evaluate research in science education. Based on National Educational Technology Standards for Students, the five attitude items were adapted from the Otsego Northern Catskills Information Literacy Scope & Sequence; the Library Awareness Skills include the concept of library, behavior, and etiquette. The 20 skills items were adapted from the Association of College and Research Libraries (ACRL) standards 1, 2, 3, and 5 in the Information Literacy Competency Standards for Higher Education to assess the degree to which students felt able to review and conduct rigorous research in science education. A fourth section focused on the learning environment; 20 items from Taylor and Fraser's widely-used and highly-reliable Constructivist Learning Environment Survey were used to quantify student perceptions in five scales: Personal Relevance, Uncertainty, Critical Voice, Student Negotiation, and Shared Control.

Librarian had an active role in course preparation or teaching of class.

Several librarians gladly embraced active roles in course preparation. The instructors met with the campus literacy librarian, distance education librarian, and departmental library liaison on numerous occasions before, during, and after the semester. These meetings served as a catalyst for matching course elements like announcements, assignments, discussions, and project tasks to student-centered goals and personally-relevant objectives. Our science education reference librarian (Stephanie Isham) took the initiative to develop several custom tutorials in support of this course; topics included an introduction to ERIC, evaluating sources, using the UTD catalog, introduction to the McDermott Library webpage, and popular magazines and scholarly journals, for example. She remained actively engaged in the course delivery. With a 'student' role designation, she experienced the course with the same view as the students that she supported – without the burden of additional technical or privacy concerns. She regularly communicated with students via email and the discussion board. Equally important, she also maintained open communications with the instructors. For example, she wrote: "There is a posting for SCE 5305 about if reports and dissertations, specifically ERIC documents, can be primary sources. The student wants to know how to tell if a report is good primary source. I'm working on my response and wanted to check with you and make sure I'm on the same page before I post my answer. EDs can be primary sources if they contain original research and meet the criteria we're teaching, after all dissertations are supposed to be original research. Are you including non-journal sources in the final assignment, should I steer the student toward journal sources only?"

How is this course unique in its integration of the Library?

This course is likely most unique in its integration of library resources because of its collaborative design and comprehensive implementation. In retrospect, the complete process evolved over two

UT Library Directors' Award for Excellence in Library Resource Integration

Nomination Form - Nominations must be submitted by April 13, 2007.

year's worth of conversations that lead to insights on how recognizing the disconnect between the practice through which library resources have traditionally been conveyed to students impacted on the values we wanted them to realize as UT students and to perpetuate as lifelong learners. On Nix's request, the UTTC Digital Librarian (Terry Barksdale) assisted the component faculty and staff with course design, activity implementation, and evaluation items. An experienced librarian and online educator, Barksdale's matchless perspective advanced our understanding of the differences between traditional library instruction and innovative resource integration. By merging Nix's passion for learning environments research and Ledbetter's expertise in evaluating research in science education with Barksdale's passion for lifelong literacy and Isham's expertise in educational information literacy, library instruction was strategically integrated into this re-designed coursework rather than simply tacked on as non-substantive 'busywork'.

We found that a balance among four key elements – focus, design, implementation, and evaluation – was imperative for relevant library integration as opposed to traditional library instruction. As noted in the UT4Me Fall 2006 UTTC Community newsletter, "Librarians and Faculty who have participated in this process indicate they found the quality of the student's research questions and skills improved. Stephanie Isham, a reference librarian at UT Dallas says she is getting more traffic... about search strategies, than ever before... beyond the basics such as 'how do I find articles,' or 'do we have this journal?'" Dr. Nix, UT Dallas, reported that she is thrilled with the success of the online pilot. Incorporating information literacy activities into online learning at the point of need is 'catapulting our students ahead of what is happening everywhere' with regard to information literacy." What we didn't realize at the time was how critical this conceptual framework was to defining the individual roles that led to successful course delivery. Guided by focused literacy characteristics, we discovered techniques for using library resources to stimulate student performance and motivate student achievement in this introductory research course. Comparable versions of new composite '*Literacy Questionnaires*' have been developed for other courses to assess tool, research, social-structural, publishing, emerging technology, and critical literacy aspects to create a comprehensive matrix for overall program evaluation.

Supporting Documentation

Please attach supporting documentation such as screen shots, syllabus, assignments.

Attachment 1: SCE5305_Course-Documents.PDF

Attachment 2: SCE5305_Screen-Shots.PDF

Attachment 3: SCE5305_Literacy-Questionnaire.PDF