# BEN Scholars Program:
# Preliminary Evaluation Report – Year 2
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## Goals and Objectives of the BEN Scholars Program

The goal of the BEN Scholars Program is to promote the use of digital library resources and student-centered teaching and learning methods in higher education, specifically in biological sciences lecture and laboratory courses, and in research training programs. The program works both directly and indirectly: Directly with faculty as BEN Scholars, and indirectly through outreach activities led by BEN Scholars. Outreach activities are aimed at biological sciences faculty and are carried out on campus with departments, locally throughout the region, and nationally through professional societies.

**Program Objectives** - As a result of the BEN Scholars Program, both BEN Scholars and those involved in their outreach activities will:

A. Increase their use of digital libraries and e-resources, specifically:
1. The BEN portal and its resources;
2. The digital libraries and e-resources of BEN Collaborators;
3. The NSDL University Faculty Page, including the Expert Voices to biological science.

B. Submit a learning object to one of the BEN Collaborator libraries or the BEN Portal OR consider submitting a learning object to one of the BEN Collaborator libraries or the BEN Portal.

## The Current Report

The following report summarizes the current status of the evaluation of the 2008 BEN Scholars Program, a component of the NSDL-sponsored Pathways project, BiosciEd Net (BEN). The BEN Scholars Program is in its second year of development. The second cohort of BEN Scholars (N=20) was selected in April 2008, attended the first BEN Scholars Institute in July 2008, and are currently working toward the completion of two major project tasks: 1) the development and submission of a learning object for review and inclusion in one of the BEN digital libraries; and 2) the development and implementation of a professional development activity to help undergraduate faculty learn about the availability and use of digital library resources to enhance teaching and learning. Therefore, the current report provides both formative information on the BEN Scholars Institute and a status report on the 2008 Scholars.

## BEN Scholars Institute – Evaluation Overview

The BEN Scholars Institute was designed to provide BEN Scholars with tools and training that will help them meet the program goals and objectives listed above. The three-day Institute offered opportunities for Scholars to both increase their knowledge about teaching and learning and develop skills in using digital libraries and thinking about appropriate resources for submission. Greater detail on the Institute and its agenda are provided elsewhere.

**Institute Goals and Objectives**
The goals of the BEN Scholars Institute are to:
1. Provide BEN Scholars with a framework for using digital libraries and student-centered teaching and learning in higher education, specifically in biological sciences lecture and laboratory courses and in research training programs; and

2. Provide BEN Scholars with resources and strategies to allow them to promote this framework to their colleagues.

In terms of **measurable objectives**, as a result of the BEN Scholars Institute:
A. BEN Scholars will increase their facility in using and their actual use of the following digital libraries:
1. The BEN portal;
2. The digital libraries of BEN Collaborators; and/or
3. The NSDL and NSDL Pathways libraries.

B. BEN Scholars will increase their understanding of student-centered learning methods, including:
1. Inquiry-based teaching;
2. Interactive lectures;
3. Authentic assessment;
4. Problem-based learning;
5. Use of technology in teaching; and
6. Career information integration.

C. BEN Scholars will increase their understanding of the importance of and integration methods for quantitative skills needed in the biological sciences.

D. BEN Scholars will successfully develop and submit a teaching resource for inclusion in a BEN –related digital library, including:
1. Selecting an appropriate library for submission, including appropriate content area, resource type, and copyright requirements;
2. Developing a resource that meets the required guidelines for inclusion in that library; and
3. Successfully utilizing the online tools to describe the resource (metadata);
4. Working with the library staff and reviewers to complete any revisions required following the review process.

E. BEN Scholars will expand their skills and available strategies and tools to allow them to promote the use of the BEN portal, digital libraries of BEN Collaborators, and NSDL and submission of teaching resources to digital libraries of BEN Collaborators to their colleagues.

**Evaluation Methods**
Scholars completed an entry and exit survey at the Institute. In addition, they will complete an online follow-up survey later in their fellowship period. The surveys provide data for both formative and summative evaluation. In addition to survey data, the Scholars' work in the program (pre- and post-Institute assignments, the learning resources they developed, and the professional development activities they conducted) also provide evidence for the program evaluation.

**Formative Evaluation**

This report provides initial formative feedback on the 2008 BEN Scholars Institute.

## I. Course Logistics and General Content

Scholar responses on the exit survey indicate that the logistics and quality of Institute content were highly rated by the participants (Table 1). Nearly all Scholars rated the Institute logistics and presenters very highly. Scholars rated the 2008 July Institute higher in terms of convenience of timing (mean rating = 4.6) compared to the December 2006 Institute (mean rating = 2.9). In 2006, Scholars did not feel that there was adequate time for reflection (mean rating = 3.6) but in 2008, they rated the time allowed for reflection higher (mean rating = 4.1. Similarly, the 2006 Scholars did not feel strongly that the presenters provided for a variety of learning styles (mean rating = 3.4) but the 2008 Scholars gave this a higher rating (4.4).

**Table 1: 2008 and 2009 Scholar Feedback
on Course Logistics and General Content, by Year**

| *Statement* | *2006 Mean ratings* | *2008 Mean rating* |
|---|---|---|
| Information provided a realistic description of the Institute. | 4.0 | 4.5 |
| The location of the Institute was convenient and/or accessible. | 4.7 | 4.6 |
| The Institute was offered at a convenient time of year. | 2.9 | 4.6 |
| The presenters were well-prepared. | 4.5 | 4.7 |
| Participants' questions and concerns were addressed effectively. | 4.4 | 4.7 |
| The presenters provided for a variety of learning styles. | 3.4 | 4.4 |
| Adequate time was allowed for participants to reflect on and relate material to their experience and needs. | 3.6 | 4.1 |

## II. Pre-Institute Assignments

2008 Scholars completed five pre-Institute assignments and rated their usefulness at the end of the Institute (Table 2). They gave the listserv introductions activity and an exploration of BEN similar ratings as in 2006. The activity on planning the teaching resource was revised after receiving a low rating in 2006 and received a much higher rating in 2008. Two additional exercises were added in 2008 and both received high usefulness ratings from Scholars.

**Table 2: Scholar Feedback on Usefulness
of Pre-Institute Assignments, by Year**

| *Assignments* | *2006 Mean rating* | *2008 Mean rating* |
|---|---|---|
| 1. Introducing yourself to the group | 4.4 | 4.4 |
| 2. Using the BEN portal | 4.3 | 4.3 |
| 3. Planning Your Teaching Resource | 3.7 | 4.5 |
| 4. Preliminary Outreach Planner | NA | 4.2 |
| 5. Pre-institute Readings | NA | 3.9 |

## III. Institute Plenary Talks

As in 2006, the Scholars rated the plenary talks highly in terms of their overall usefulness (Table 3). Some topics that received lower ratings in 2006 were not included in 2008. The two new topics (Ben Outreach Examples and Next Steps in the BEN Scholarship) focused on what

Scholars would do in the program after the Institute. Both talks received positive ratings from the 2008 Scholars. Some Scholars felt that the presentation on how faculty members use NSDL resources was redundant because they also received a pre-Institute reading on this finding.

**Table 3: Scholar Feedback on Usefulness of Institute Plenary Talks, by Year**

| Assignments | 2006 Mean rating | 2008 Mean rating |
|---|---|---|
| BEN Goals & Expected Outcomes (George) | 4.2 | 4.6 |
| Student-Centered Learning: Inquiry, Interactive Lecture & Authentic Assessment (Matyas) | 4.4 | 4.1 |
| How Faculty Use NDSL Resources (McMartin, Wolf)* | 4.1 | 3.6 |
| NSDL Overview (McIlvain) | 4.3 | 4.4 |
| Introduction to the BEN Libraries and Submissions (Matyas, Gull, Riem)* | 4.3 | 4.5 |
| Leadership and Outreach Skills (Chang) | 4.2 | 4.7 |
| BEN Outreach Examples and Strategies (George) | NA | 4.3 |
| Ben Scholars: Next Steps (George) | NA | 4.5 |

* These presentations were made by different speakers in 2006 than in 2008.

## IV. Institute Interactive Activities

As they did in 2006, the 2008 Scholars rated the Institute small group work and interactive exercises very highly (Table 4). Several activities that were added during the 2006 Institute were structured into the 2008 Institute and received high ratings, including the working groups on incorporating student-centered learning, using BEN, and selecting and BEN library for submission. The ad hoc review of submitted items and the sharing best practices sessions were very highly rated as were the Scholars' presentations.

**Table 4: Scholar Feedback on Usefulness
of Small Group Work and Interactive Exercises**

| Assignments | 2006 Mean rating | 2008 Mean rating |
|---|---|---|
| Discussions of Greatest Challenges in Planning Your Digital Library Resource and Outreach Activities (Mentors) | NA | 4.3 |
| Working Groups: Incorporating Student-Centered Learning | NA | 4.5 |
| Using BEN: What Did You Find? | NA | 4.5 |
| Discussion groups: Selecting a BEN Library for Submission | NA | 4.4 |
| Working Groups: Work on your BEN Teaching Object Submission | 4.6 | 4.1 |
| Dinner activity: Ad hoc Review of Submitted Items (Chang – leader) | NA | 4.8 |
| Sharing Best Practices (Scholars) | 4.2 | 5.0 |
| Working Groups: Work on Your BEN Outreach Activities | 4.2 | 4.4 |
| Scholar Presentations of Their Submission & Outreach Plans (Scholars) | 4.5 | 4.7 |

<div align="center">**Summative Evaluation**</div>

The Institute provided an opportunity to gather both baseline and initial impact data on Scholars. Scholars were asked on the entry and exit surveys to rate their skills and knowledge level in the four major areas targeted by the BEN Scholars program: teaching and learning, using digital libraries, contributing to a digital library, and leading professional development for colleagues.

## I. Initial Use of Digital Libraries

One of the long term objectives for the BEN Scholars program is to increase faculty use of digital library resources to improve teaching and learning. The Institute afforded an opportunity to gather baseline data on the Scholars' initial use of digital libraries and to identify the libraries they already use. As shown in Table 5, neither the 2006 or 2008 BEN Scholars were heavy users of BEN, BEN partner digital libraries, the NSDL, or other digital libraries. Overall, they were most likely to use one or more of the BEN Partner libraries.

### Table 5: Scholars' Initial Use of Digital Libraries[*]

| Rating of use before starting Scholars program | 2006 Mean rating | 2008 Mean rating |
|---|---|---|
| The BEN Portal | 2.2 | 1.8 |
| BEN Partner Libraries | 2.8 | 3.1 |
| The NSDL Portal | 1.8 | 2.0 |
| Other NSDL Pathways libraries | 1.2 | 1.5 |
| Other NSDL libraries | 1.1 | 1.3 |
| Other digital libraries | 2.9 | 2.3 |

\* On a scale where 1= "Never" and 5 = "Frequent"

## II. Development of BEN Scholars Skills and Knowledge

As indicated in Table 6, Scholars' self-ratings of their skills/knowledge on a scale where 5 = "excellent" and 1 = "very weak" increased significantly on nearly all questions. In the area of teaching and learning, the 2008 Institute agenda dropped lectures on problem-based learning, quantitative skills integration, and career integration, therefore, the ratings for these skills did not change dramatically. Scholars rated their skills/knowledge in the use of digital libraries and submitting to a digital library much higher after the Institute. They also felt their skills and knowledge base for leading professional development for their colleagues improved as a result of the Institute.

**Table 6: Scholar Self-ratings of Targeted Knowledge and Skills, by Time Point**

| Skills/Knowledge Areas | Mean Scholar self-rating at time of survey [*] | | |
|---|---|---|---|
| | Entry survey | Exit survey | Sig. |
| **Teaching and Learning** | | | |
| Student-centered teaching and learning | 4.0 | 4.4 | .01 |
| Inquiry-based teaching and learning | 3.7 | 4.3 | <.01 |
| Interactive lecture methods | 3.8 | 4.0 | .02 |
| Authentic assessment | 2.7 | 3.6 | .001 |
| Problem-based learning** | 3.2 | 3.8 | .003 |
| Use of technology in teaching | 3.8 | 4.5 | .0001 |
| Integrating career information into lessons** | 2.9 | 3.3 | ns |
| Integrating quantitative skills development into biological sciences curricula/lessons** | 3.4 | 3.6 | ns |
| **Using Digital Libraries** | | | |
| Using a digital library to find resources for enhancing lecture materials | 3.2 | 4.7 | <.0001 |
| Using a digital library to find new laboratory lessons. | 2.9 | 4.7 | <.0001 |
| Using a digital library to find materials for student use. | 3.0 | 4.7 | <.0001 |
| Comparing digital libraries for quality of review and content. | 2.3 | 4.2 | <.0001 |
| Understanding the difference between a digital library and a regular website with teaching resources. | 3.5 | 4.7 | <.001 |
| **Submitting to a Digital Library** | | | |
| Identifying materials of one's own that are appropriate for submission to a digital library | 2.9 | 4.8 | <.0001 |
| Submitting a teaching resource of one's own to a digital library | 2.7 | 4.5 | <.0001 |
| **Leading Professional Development Activities** | | | |
| Developing and implementing professional development activities for one's colleagues | 2.9 | 4.7 | <.0001 |
| **Total score for self-rated skills** | **50.9** | **68.8** | **<.0001** |

[*] On a scale where 5 = "Excellent" and 1 = "Very Weak." Significance levels are for a one-tailed t-test of means, without assumption of equal variances.
** These were covered in 2006 but not in 2008 Institute, therefore, their scores were not expected to increase.

## III. Post-Institute Activities

Following the Institute, Scholars were to focus on developing their teaching resource for submission to one of the BEN digital libraries, either as a direct submission or as a submission to a BEN Partner journal that is catalogued in a BEN Partner library. As of mid-March 2009, four Scholars (20%) have submitted their item to their BEN Mentor for review and, subsequently, have submitted it to a BEN Partner library or journal. Five Scholars (25%) have submitted their resource to their Mentor for review. Nine Scholars (45%) have not yet submitted their resource to their Mentor for review but most plan to do so within the current month. Two Scholars (10%) have not reported on the status of their resource.

## IV. Summative Evaluation Summary

As noted previously, the BEN Scholars Institute was designed to have specific impacts on the Scholars. Evidence provided by this initial evaluation report is summarized below by each of the Institute objectives.

*A. BEN Scholars will increase their facility in using and their actual use of the following digital libraries: The BEN portal; the digital libraries of BEN Collaborators; and/or the NSDL and NSDL Pathways libraries.*

**Evidence: 2008 Scholars' initial use of these digital libraries was very limited with most participants indicating that they "rarely" or "never" used these online resource repositories. However, their interest in learning how to use digital libraries (Table 1), their usefulness ratings of the pre-Institute exercises on digital library exploration, and their self-ratings of increases in their understanding of how to use a digital library provide evidence that, even at this early stage in their fellowship, significant progress is being made on this objective.**

*B. BEN Scholars will increase their understanding of student-centered learning methods, including: Inquiry-based teaching; interactive lectures; authentic assessment; problem-based learning; use of technology in teaching; and career information integration.*

**Evidence: Scholars rated the presentations and activities on most of these topics very highly. For those knowledge/skills areas directly targeted by the Institute, their self-ratings significantly increased as a result of the Institute.**

*C. BEN Scholars will increase their understanding of the importance of and integration methods for quantitative skills needed in the biological sciences.*

**Evidence: This objective was not targeted in 2008. Evidence from the 2006 BEN Scholars group suggested that this topic needs separate and more extensive professional development, more than provided by being a subcomponent of the BEN Scholars Program. This may provide the context for a second Scholar program in future years.**

*D. BEN Scholars will successfully develop and submit a teaching resource for inclusion in a BEN –related digital library, including: Selecting an appropriate library for submission, including appropriate content area, resource type, and copyright requirements; Developing a resource that meets the required guidelines for inclusion in that library; Successfully utilizing the online tools to describe the resource (metadata); and Working with the library staff and reviewers to complete any revisions required following the review process.*

**Evidence: Each BEN Scholar developed and presented a detailed outline for the learning object they are developing for submission. Most could identify the digital library (BEN, BEN partner, or other) to which they planned to submit. Nearly half of Scholars have submitted their teaching resource to either their Mentor or both their Mentor and, subsequently, a BEN digital library or journal. Nearly all BEN Scholars plan to submit their teaching resource to their Mentor for review within the year following the Institute. Additional data collected in the coming months will allow further exploration of this objective.**

*E. BEN Scholars will expand their skills and available strategies and tools to allow them to promote the use of the BEN portal, digital libraries of BEN Collaborators, and NSDL and submission of teaching resources to digital libraries of BEN Collaborators to their colleagues.*

**Evidence: BEN Scholars rated their understanding of the BEN and NSDL digital portals as significantly improved as a result of the Institute. They also rated their skills/knowledge in leading professional development activities for colleagues as significantly higher following the Institute. Each Scholar developed an outreach plan for sharing his/her knowledge with colleagues. Additional data will be collected on the implementation of these plans.**