

**BEN Scholars Program:
Preliminary Evaluation Report – Year 1
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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 BEN Scholars Program, a component of the NSDL-sponsored Pathways project, BiosciEd Net (BEN). The BEN Scholars Program is in its first year of development. The first cohort of BEN Scholars (N=25) was selected in fall 2006, attended the first BEN Scholars Institute in December 2006, 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 participating BEN 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 in this report.

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

Since this was the first BEN Scholars Institute, receiving formative feedback from the participants was set as a high evaluation priority. The following section provides a summary of formative feedback on the 2006 BEN Scholars Institute.

I. Alignment of Content with Scholars' Perceived Needs

On an Institute entry survey, Scholars were asked to list three things they hoped to learn during the three-day meeting. These items were grouped by topic and compared to the Institute content to determine whether content was aligned with the perceived needs and expectations of the incoming Scholars. As shown in Table 1, Scholars were interested in learning about most of the Institute topics. They expressed most interest in using digital libraries to find teaching resources (21 comments) and in developing learning objects to submit to digital libraries (13 comments). In terms of teaching and learning, Scholars expressed the Institute most interest in authentic assessment methods (5 comments) and improving teaching learning in large classes/lectures. Few Scholars expressed interest in using technology to enhance student learning or in learning about leadership and outreach skills needed to develop and lead professional development activities. Overall, however, the Scholars' expressed interests matched the Institute content.

Table 1: Comparison of Institute Content and Scholars' Expectations

Institute Content	What Scholars Hoped to Learn at the Institute
BEN Scholars Program Goals & Expected Outcomes	<ul style="list-style-type: none"> • Learn more about BEN collaboration and how to use it effectively in my courses
Developing Learning Objects and submitting to BEN	<ul style="list-style-type: none"> • Be able to format materials for submission to a digital library • Develop resources • Development of web based materials for college and high school teachers • How to best develop my own resources • How to develop curriculum appropriately for broad dissemination • How to prepare and submit materials to the NSDL • How to publish and make known items I have developed • I hope to learn more about the logistics of depositing novel digital video and images at BEN or collaborators, in particular with respect to copyrights, etc • Learn about developing animations/movie editing – at least get info on where to start • Learn to id better what I can contribute • Process for development of materials for inclusions in digital libraries. • What are suitable resources for libraries (although I tend to be liberal • What type of assessment info needed to accompany submission and how extensive does it need to be
Leadership & Outreach Skills	<ul style="list-style-type: none"> • Better learn what folk need to know in prepping materials for libraries and how I can help to facilitate • How to help and persuade colleagues to use the NSDL • Learn how to assist colleagues in using digital resources • More specifics on outreach – how do I assess if I was effective or not

Institute Content	What Scholars Hoped to Learn at the Institute
	<ul style="list-style-type: none"> • Ways to approach faculty workshops to spread good ideas about student learning and teachers approaches
Interactive Exercises and Scholar Sharing Sessions	<ul style="list-style-type: none"> • Get some fresh ideas from other educators • Hear ideas that are working well for others
Using BEN and NSDL to find teaching resources	<ul style="list-style-type: none"> • Additional Interactive resources • Array and level of digital resources available in digital libraries for aquatic science • Characteristics of effective digital libraries • Find more resources • How to assess the usefulness of resources • How to compare and evaluate databases/libraries • How to find materials quickly in the libraries • I hope to learn about resources I have not yet found in my own searches that will enhance my access to digital images and videos • Learn about more digital library resources • Locate resources • Resources for future references • What digital resources are currently available • What new materials are available • What quality resources are available • What type of information is available • Where all the good materials are buried • Who is are using the DL • How BEN works and how to ID resources for it • How to obtain info from APS without logging in each time • I would like to become more familiar with the relationship between and among the NSDL and BEN collaborating libraries • What is needed to make effective digital libraries
Student-Centered Learning (Inquiry, Interactive Lecture & Authentic Assessment, Case Studies, Problem-Based Learning)	<ul style="list-style-type: none"> • Assessment techniques • How can I make use of these resources to improve student centered learning in very large class size and program • How to assess/evaluate curriculum within the classroom and see if learning & student engagement has improved • How to improve and enhance learning in lab exercises • How to improve and enhance science learning in lecture courses • How to improve teaching • Increase student engagement • What is authentic assessment in the classrooms • Learn how to use other types of assessments • Longitudinal assessment methods – how do I measure “success” in intro bio in terms of carry-over to upper division? • How to use NSDL resources in my teaching
Using Technology to Enhance Student Learning	<ul style="list-style-type: none"> • How to use technology and interactive “clickers” effectively • Increase my incorporation of online inquiry-based learning activities in my course • Increase the use of technology to re-teach difficult content • How to better utilize these resources in the classroom • Ways to most effectively use resources
Developing Student Quantitative Knowledge and Skills	No Scholar comments
No formal Institute coverage	<ul style="list-style-type: none"> • What is integrated career information

II. Course Logistics and General Content

Scholar responses on the exit survey indicate that, for the most part, the logistics and quality of Institute content were highly rated by the participants (Table 2). Nearly all Scholars rated the Institute logistics and presenters very highly. From the ratings and the comments (see Appendix A), three areas for possible improvement were noted. A number of Scholars felt the timing of the Institute (early December) was problematic because it overlapped with the end of their semester/term and/or with final exams for their students. Some Scholars wanted more time for discussion and reflection in the Institute agenda while others wanted fewer “lecture” sessions and more interactive sessions to allow for better engagement of those with different learning styles, and more discussion.

Table 2: Scholar Feedback on Course Logistics and General Content

<i>Statement</i>	<i>Mean rating</i>	<i>Percentage (%) of respondents</i>				
		5 Strongly agree	Agree	No opinion	Disagree	1 Strongly disagree
Information provided a realistic description of the Institute.	4.0	25%	54%	13%	8%	-
The location of the Institute was convenient and/or accessible.	4.7	76%	20%	4%	-	-
The Institute was offered at a convenient time of year.	2.9	12%	28%	4%	48%	8%
The presenters were well-prepared.	4.5	60%	32%	4%	4%	-
Participants’ questions and concerns were addressed effectively.	4.4	44%	56%	-	-	-
The presenters provided for a variety of learning styles.	3.4	4%	4%	60%	12%	20%
Adequate time was allowed for participants to reflect on and relate material to their experience and needs.	3.6	20%	40%	20%	16%	4%

III. Pre-Institute Assignments

Scholars completed four pre-Institute assignments and rated their usefulness at the end of the Institute (Table 3). They rated the listserv introductions activity and an exploration of BEN as the most useful, but most rated identifying BEN resources and completing a preliminary planner for the development of their online resource submission as useful, as well. Technical problems with the listserv by which these assignments were distributed and completed lowered some Scholars' ratings (see comments in Appendix A). Some Scholars also wanted a better understanding of what types of resources were acceptable for submission before starting their planning. For example:

- *A more explicit description of the promoters for an "acceptable" resource would have been useful. While most people had such a resource in mind, my proposal was focused on developing the resources on BEN in a more holistic manner, not to develop a discreet exercise.*
- *Too early in the process - not enough information this early in the game to select an appropriate resource - ends up I changed my mind 3 times and I could have saved my time and effort until I got to the workshop.*

In addition, some Scholars noted that the mentors should have received the assignments as well as the Scholars so they were better equipped to help those in their groups.

Table 3: Scholar Feedback on Usefulness of Pre-Institute Assignments

Assignments	Mean rating	Percentage (%) of respondents				
		5 Very Useful	4	3	2	1 Not at all useful
1. Introducing yourself to the group	4.4	48%	43%	9%	-	-
2. Get to know the BEN site	4.3	52%	30%	17%	-	-
3. Identify 3 useful BEN resources	3.9	29%	29%	29%	4%	8%
4. Complete the Teaching Resource Prelim. Planning Form	3.7	22%	48%	13%	13%	-

III. Institute Plenary Talks

Overall, Scholars found the plenary talks very useful, with average ratings from 3.8 to 4.4 on a scale where 5 = “Very useful” and 1 = “Not at all useful” (Table 4). Of the twelve plenary presentations, nine (75%) were rated as “Useful” or “Very useful” by at least 75% of the Scholars. The talk on inquiry, interactive lecture, and authentic assessment received the highest overall rating; this may reflect the fact that the talk incorporated both topics that the Scholars had been looking for in the Institute (authentic assessment and improving lectures, Table 1) and that the presentation incorporated more interactive components, something Scholars asked for more of in future Institutes (Table 2).

Comments suggested that the Scholars were looking to these plenary talks as examples of how lectures could be made more interesting and how digital resources and technology could be incorporated into presentations (see Appendix A). For example:

- *The talks focused on student learning were useful but felt quite redundant. Most talks suffered from the massive design flaw. We are warned against: they all had slide after slide of text with very little interactive material. For example, had we been navigating BEN & NSDL in a directed group activity, we would have a platform to discuss the problems, strengths, etc of the portal(s) and interface(s) and resource(s).*
- *Use technology to teach about technology, please. It was great to interweave lecture and small group activities - please add live demos of BEN, NSDL, actual collections - then turn participants loose to practice. Too many long lectures in a row - need more alternation of big blocks of activities (1 hour lecture; 1 hour mini-lecture/demo/hands-on activity...).*
- *I loved the use of quantitative knowledge & skills especially for the integration of science & technology. I felt that some of the other lectures could have been improved by integrating more technology beyond words on PowerPoint. I especially appreciated having a copy of the presentations so I could focus on listening.*

Akli’s talk and discussion about the functionality of the BEN portal was not rated as highly as most of the other talks. This talk focused on the [then] current status of the portal and the revisions underway for it. The Scholars were invited to offer suggestions for how the portal could be improved rather than being taught how to use the current portal. Therefore, the discussion was less a tutorial and more a discussion of shortcomings. As one Scholar said, “The presenters were diligent and answered most of my questions and responded to the ones raised on the floor. They were honest about the current status of the portals and receptive to the suggestions.” A few Scholar comments indicated that there was still confusion about the relationship between BEN and NSDL.

Table 4: Scholar Feedback on Usefulness of Institute Plenary Talks

Assignments	Mean rating	Percentage (%) of respondents				
		5 Very Useful	4	3	2	1 Not at all useful
NSDL Goals & Expected Outcomes (McIlvain)	4.2	36%	48%	12%	4%	-
BEN Goals & Expected Outcomes (George)	4.2	44%	40%	12%	4%	-
Student-Centered Learning I: Inquiry, Interactive Lecture & Authentic Assessment (Matyas)	4.4	48%	48%	4%	-	-
Student-Centered Learning II: Case Studies, Problem-Based Learning, & the 3 P's (Donovan)	4.1	40%	36%	16%	8%	-
Using Technology to Enhance Student Learning (George)	3.9	20%	52%	28%	-	-
Browsing BEN: A Follow-Up Discussion (Akli)	3.8	32%	28%	32%	8%	-
NSDL Overview (McIlvain)	4.3	40%	48%	12%	-	-
How Faculty Use NDSL (Khoo)	4.1	28%	56%	16%	-	-
Ben Digital Library Submission (Chang, Matyas, Akli)	4.3	40%	48%	12%	-	-
Leadership & Outreach Skills (Chang)	4.2	36%	48%	16%	-	-
Talk It Up: Outreach Strategies for Your Work, BEN, & NSDL (Giersch)	4.0	32%	40%	28%	-	-
Developing Student Quantitative Knowledge and Skills (Joiner)	4.2	38%	41%	21%	-	-

IV. Institute Interactive Activities

The Scholars rated the Institute small group work and interactive exercises very highly (Table 5), with mean usefulness ratings of 4.2 to 4.6. For all but one of these activities, 80% or more of the participants rated them as “useful” or “very useful.” The technology demos were highly rated by 73% of the responding Scholars but it should be noted that this question was added to the survey during the Institute and was answered by only 18 (72%) of the participating Scholars. Comments about the technology sessions were generally positive. For example:

- *I wasn't able to see all the technology sharing sessions, but the ones I saw gave me ideas I can use.*
- *I loved the show and tell, technology sharing - I wish I could have attended every sessions and that best practices would have been integrated into it.*
- *Technology Sharing (show and tell) gave us more resources to tap and the presenters were generous in their offers to share the resources even before these are put up on the portals.*

From the survey comments (see Appendix A), it was clear that networking with other faculty was an important component of the Institute. For example:

- *The small group work was the most useful aspect of the weekend. The informal interactions were very valuable*
- *I really like the times when we got to share with each other. Learning a lot from other people. Made some good new friends. Let's meet again!*
- *...The participants shared their expertise on how to improve undergraduate (and graduate) STEM education. Being with a smaller group allowed for more time to discuss issues related to education and the scholarship of teaching and learning.*

Scholars also commented on the helpfulness of the mentors leading the small group work. For example:

- *Good all the way around. Mentors helped to keep things focused. Peer interaction was fantastic.*
- *The mentoring sessions were very effective at helping refine and focus the potential submission and gave me a chance to get to know colleagues.*

Table 5: Scholar Feedback on Usefulness of Small Group Work and Interactive Exercises

<i>Assignments</i>	<i>Mean rating</i>	<i>Percentage (%) of respondents</i>				
		5 Very Useful	4	3	2	1 Not at all useful
Individual/group work: Teaching Resource Refinement	4.6	64%	32%	4%	-	-
Breakfast Discussion: Sharing New/Best Practices	4.2	40%	48%	8%	4%	-
Questions & Reflections	4.2	41%	41%	18%	-	-
Working groups: Outreach planning	4.2	48%	32%	12%	8%	-
Individual presentations: & group feedback on Scholar's plan	4.5	56%	36%	8%	-	-
Discussion: BEN Scholars – Next Steps	4.4	52%	40%	4%	4%	-
Working groups: Technology demos by Scholars	4.2	34%	39%	22%	-	-

Summative Evaluation

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 9, the 2006 BEN Scholars as a group were not already heavy users of BEN, BEN partner digital libraries, the NSDL, or other digital libraries. A third of the Scholars had never used the BEN portal before starting the fellowship. Nearly half (46%) said they were frequent or occasional users of one of the BEN partner libraries, but only five respondents indicated which BEN partner library they used. The large majority (88%) had never/rarely used the NSDL portal or other Pathways sites...one person asked what a "Pathways" library was. Nearly half of the BEN Scholars said they were "frequent" or "occasional" users of other digital libraries. However, when asked to name which libraries they used, many did not list any libraries, and some listed resource websites such as NASA.gov

and USDA.gov rather than true digital libraries. These responses suggest that Scholars were rating their use of online resources rather than resources systematically catalogued in digital libraries.

Table 10: Scholars’ Initial Use of Digital Libraries

<i>Rating of use before starting Scholars program</i>	<i>Mean rating</i>	<i>Percentage (%) of respondents</i>			
		5 Frequent	4 Occasional	2 Rare	1 Never
The BEN Portal	2.2	-	29%	38%	33%
BEN Partner Libraries	2.8	21%	25%	25%	29%
The NSDL Portal	1.8	-	17%	33%	50%
Other NSDL Pathways libraries	1.2	-	4%	8%	88%
Other NSDL libraries	1.1	-	-	8%	92%
Other digital libraries	2.9	33%	13%	16%	38%

II. Development of BEN Scholars Skills and Knowledge

As indicated in Table 10, Scholars’ self-ratings of their skills/knowledge on a scale where 5 = “excellent” and 1 = “very weak” increased significantly for each of the skill/knowledge areas. In the area of teaching and learning, the Institute placed greater emphasis on student-centered learning (including inquiry, interactive lecture, authentic assessment, and problem-based learning) in both the plenary talks and the resource development activities; not surprisingly Scholars felt their skills increased more in these areas than in integrating technology and quantitative skills in lessons where they heard about these areas in sessions but were not required to apply them to development of their teaching resource. Little time was spent in the Institute on how to integrate career activities into the curriculum and, correspondingly, the Institute had a limited impact on the Scholars in this particular area. The career integration activities will be emphasized more in the post-Institute activities for Scholars.

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 10: 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	3.4	4.1	.0001
Inquiry-based teaching and learning	3.4	4.1	.0001
Interactive lecture methods	3.5	4.0	.004
Authentic assessment	2.9	3.4	.006
Problem-based learning	3.5	3.9	.008
Use of technology in teaching	3.7	4.1	.002
Integrating career information into lessons	3.0	3.3	.04
Integrating quantitative skills development into biological sciences curricula/lessons	3.2	3.5	.03
Using Digital Libraries			
Using a digital library to find resources for enhancing lecture materials	3.3	4.0	.004
Using a digital library to find new laboratory lessons.	2.9	3.8	.0007
Using a digital library to find materials for student use.	3.0	3.7	.003
Comparing digital libraries for quality of review and content.	2.8	3.6	.003
Submitting to a Digital Library			
Identifying materials of one's own that are appropriate for submission to a digital library	3.0	4.3	<.0001
Submitting a teaching resource of one's own to a digital library	2.4	4.0	<.0001
Leading Professional Development Activities			
Developing and implementing professional development activities for one's colleagues	2.9	3.9	.001
Total score for self-rated skills	47.2	61.5	<.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.

III. Summative Evaluation Summary

As noted earlier in this report, 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: Scholars' initial use of these digital libraries was very limited. 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 these topics very highly. Their self-ratings of their knowledge/skills in these areas 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: Scholars gave the plenary presentation on this topic very high ratings. Furthermore, their self-ratings of their knowledge/skill in this area increased modestly. This area may require more applied exercises during the Institute to adequately address this objective.

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. Further evidence will be needed to determine whether they successfully submitted their resource, developed metadata to describe it, and completed needed revisions.

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.

Appendix A: Exit Survey Comments

I. Comments on Course Logistics and General Content (Table 2)

A. Timing

- Timing was problematic; one week before my finals. My absent at a critical time in the semester will probably be a problem for my students. And I'm sure I'll hear about it upon my return.
- During finals it is tough to attend the institute.
- It would have been great to have some hands-on exercises using the portals, guided from the front, and using the provided lab types. Make it interactive; ask "how would you use this?" What's wrong or right about this resource? What could make it better?
- I'm not sure that there is a perfect time. I did scramble a bit to complete assignments for BEN while also writing final exams and grading semester end projects
- Not sure when would be a good time but during finals is not a good time. There
- For most, this is, or near finals time.

B. Compliments

- Good communication of travel, accommodation, site details.
- Great facility and food. Very thoughtful and hard-working and solicitous staff. Nice - thanks!
- Everything ran very smoothly
- The staff was excellent, I believe that the first meeting, although somewhat scattered, was well run. I'm sure most glitches were unforeseen.
- Great food! Wonderful Staff!
- Great sessions.

C. Communication before Institute

- Mentors were not on list serve - missed some information that would have helped us prepare.
- I just wanted to receive descriptions of the Institute a little earlier.

D. Formats Used in Institute

- More interactive presentations would enhance experience. Too much text on PowerPoint - Death of Vitality.
- Would like all presentations a head of time. Friday morning seemed rushed (less time). Since Friday night less structured, Friday morning could start later.
- Technology sharing, Although I got information out of other presenters only 1 person came to mine. Rotation amongst sessions needed to be better organized
- In future Institutes it might be a good idea to ask participants to describe their proposed projects in a better fashion give them more time to purpose the submission
- Presenters were generally were prepared but not always aware of what someone else had already presented - better coordination might be helpful. Overall rating - Excellent, thought-provoking and stimulating! Thanks!
- More modeling needed - not just words and visuals

E. Content of Institute

- Discussion and reflection
 - More time to discuss and brainstorm about BEN in general (rather than our individual resource).
 - Could have used more time to reflection.

- Sam's inquiry/problem-based learning and Joiner's math presentation. [Should have] group discussion of math in biology
 - There was probably enough time, but not always a clear picture of what was expected for us to reflecting on at that time.
 - Again - plenty of time to do goals/objectives. I'd rather spend time doing peer review a) get feedback; b) practice reviewing (rope us in the review process).
 - Was very little time to reflect on and relate material during Institute
 - I much appreciate the helpful of the presenters. Please be patient - don't be too slave - driving. We are busy people! Please be flexible with deadlines.
 - Better description of what a "resource" includes.
-

II. Scholar Feedback on Usefulness of Pre-Institute Assignments (Table 3)

A. Timing and listserv issues

- Good preparation, could be extended a little forward so they do not seem as rushed.
- Technical problems with the listserve probably need these activities a little less effective than they could have been.
- Of course, the list serve did not function very well, but having pre-assignments did lead up to the workshop and helped focus on it.
- Problems with listserve made this frustrating
- They were all useful in principle, but actual utility somewhat hampered by the non-functionality of the listserv (so we couldn't see other people's postings, never mind our own). The resource planner was hard, as I had a lot of questions/concerns at the time - but most are now resolved.
- Tough time of year, very compressed schedule - was a bit hard
- There were 2 problems 1) the list serve problems meant we didn't get the assignments in a timely fashion; and 2) the first 2 weeks of Dec. are the worst time of the year to take on new work
- At the start I was never sure what was expected
- The purpose of these would have been somewhat clearer if the various documents about the nature of the program had all been circulated ahead of time. I think the value of the assignments would have been somewhat enhanced as a result

B. Resource planning assignment

- A more explicit description of the promoters for an "acceptable" resource would have been useful. While most people had such a resource in mind, my proposal was focused on developing the resources on BEN in a more holistic manner, not to develop a discreet exercise.
- Too early in the process - not enough information this early in the game to select an appropriate resource - ends up I changed my mind 3 times and I could have saved my time and effort until I got to the workshop
- Getting to know BEN was useful, but frustrating due to the issues raised at the conference. May have been more useful for some, but what I prepared turned out to not be very appropriate for submission

- Would be helpful to have further clarification on teaching resource requirements before conference. Single item - teaching/learning objective learning goals
- Did not have enough information to choose an appropriate teaching resource for development - in fact, designed a different resource. No follow up assignment to introduction.

C. Using the BEN portal

- More time needed to looking at BEN architecture
- The assignments were very useful in introducing us and BEN. I quietly picked up on the limits of the portals search capabilities. A more directed search procedure (try A, try B, go here, etc.) would have been helpful
- Helped me identify suggestions that would be useful for improving the usability of BEN; helped me prepare for the workshop so that I could work more efficiently on-site

D. Networking with other Scholars

- I was very eager to find out who the other scholars were and especially, to see if what I was thinking of doing (compared to theirs) was in "sync," It was reassuring.
- Pre-workshop assign allowed me to go into the med-site (BEN and NSDL) and evaluate subjectively the influence of the site for my own purpose. The other pre-assign made me feel a part of the group already even before I met anyone

E. Mentor issues

- Mentor received offer assignments?
- Mentors weren't involved it would have been good to see these more in advance

III. Scholar Feedback on Usefulness of Institute Plenary Talks (Table 4)

A. Use of lecture format

- I think the intro talks on Thursday helped set the framework for what to come. Although I rated some sessions as less useful, that was from my perspective - we're a disparate group with a variety of interests and needs. I really needed the info on outreach to help formulate a way to effectively reach out to others.
- The talks focused on student learning were useful but felt quite redundant. Most talks suffered from the massive design flaw. We are warned against: they all had slide after slide of text with very littler interactive material. For example, had we been navigating BEN & NSDL in a directed group activity, we would have a platform to discuss the problems, strengths, etc of the portal(s) and interface(s) and resource(s).
- Use technology to teach about technology, please. It was great to interweave lecture and small group activities - please add live demos of BEN, NSDL, actual collections - then turn participants loose to practice. Too many long lectures in a row - need more alternation of big blocks of activities (1 hour lecture; 1 hour mini-lecture/demo/hands-on activity...)

- Honestly that was a long time ago; I don't remember talks independent of other information learned over institute. Excellent learned even though was previously familiar. Less organized, clear, afraid to make point? More ethereal, no specifics. I think this was more helpful for BEN than participants. Much repeat but gave needed language for outreach. Less organized, some repetition from Amy's talk (Sarah was disadvantaged by following Amy). Wow!
- I would suggest splitting up talks with discussion group activities more. There was too much sitting with presenter after presenter. Felt like I was a scientific meeting rather than an institute or workshop
- I think the talks were all quite good. I would like to have seen a little less rigid reliance accompanied by handouts with the supporting details would be my preference
- Thought things were well organized, with appropriate breaks planned

B. Content of talks

- I really was unclear about the goals and expected outcomes before arriving and the Thursday talks didn't clear up my confusion. I think a more general introduction to the whole NSF initiative would have made more sense for me.
- Very informative
- The 4's - could be I was tired/over loaded
- We pretty much knew this stuff so it was only moderately useful.
- The presenters diligent and answered most of my questions and responded to the ones raised on the floor. They were honest about the current status of the portals and receptive to the suggestions.
- We really didn't cover authentic assessment. Would be nice to be given more information on this topic - and resources for what types of assessment work best. Although I enjoyed it, it didn't seem to "flow" well with the rest of the program.
- I was struck by D. Joiner's talk on "math", "modeling" I perceived it as a "simulation" and students didn't really need to know any math in order to do the activity. So on the one hand its reassuring (I do a blood sugar/diabetes on-line simulation in one activity. so apparently I'm reinforcing math skills), but on the other hand, I wouldn't perceive that activity as "math" but as predict/describe a pattern
- I loved the use of quantitative knowledge & skills especially for the integration of science & technology. I felt that some of the other lectures could have been improved by integrating more technology beyond words on PowerPoint. I especially appreciated having a copy of the presentations so I could focus on listening
- Appreciated the idea of taking small steps and incremental implementation. Already familiar with poignant philosophy. Time might be better used to brainstorm interface improvement. Entertaining, but limited immediate utilization
- Needed the slides in handout from to take notes. What are the 3P's? I missed it. We could use some pointers on graphing, simple modeling and effective data presentation (think Edward Tufle on the ladder). I enjoyed seeing the version tool and will use it, but I end many of my students are in

need of some very basic abilities. More examples of technology would be helpful, as well as sources of support for acquiring technology

C. NSDL overviews

- Confused about relationship between BEN and NSDL
- The relationship between BEN, Partners, and NDSL is still a bit confusing

IV. Scholar Feedback on Usefulness of Small Group Work and Interactive Exercises

A. General

- I think the concept of all these exercises is good. We have to expect that the specific usefulness for any one participant is rather unpredictable. It was good just to get some responses from others and to hear what others are doing. It gives us helpful ideas even if we think that our resources are mostly already in working form. It also suggests possible collaborations. I didn't evaluate the above as highly as I did the lectures, but I'm not sure that I would change them.
- The small group activities were very valuable...much better bang for the buck than the plenary sessions. I would like to see more opportunities to actually discuss practical implementation of active learning. What do people in the group actually do, concrete examples. In addition, more opportunity to discuss other aspects of our teaching, share information about approaches to pedagogical problems (all in small discussion groups).
- Generally useful, but too long. Needed more clarity in direction - "outcomes" was not a clear part of the 1st day's breakout, at least not in our group
- The small group work was the most useful aspect of the weekend. The informal interactions were very valuable
- I really like the times when we got to share with each other. Learning a lot from other people. Made some good new friends. Let's meet again!
- I found a couple sessions useful, others not so.
- I now have a better understanding of the goals and objectives of the BEN and NSDL portals and the collaboration that takes place among all the stakeholders. The participants shared their expertise on how to improve undergraduate (and graduate) STEM education. Being with a smaller group allowed for more time to discuss issues related to education and the scholarship of teaching and learning.
- Expectations are too low - better to aim high and miss. I do appreciate the need of products. I think most have outreach plan well in hand. Some points are further clarified

B. Mentoring sessions/Teaching Resource Refinement

- Mentors were very effective in guiding group discussions. It would be helpful to get broader ideas on overhead. We had to choose 1 or 2 methods and plucked the every over, but I've already identified 5-6 and learned a few more.
- Good all the way around. Mentors helped to keep things focused. Peer interaction was fantastic.
- The mentoring sessions were very effective at helping refine and focus the potential submission and gave me a chance to get to know colleagues.

- Lots of time set aside for #18 - when in fact we'll be spending more time on this back home - would have been nice to simply build in time for simple small group discussions about BEN NSDL with staff and mentors.
- Most of us had already completed the assignment and did not need the time. Appreciated the break however.
- Very helpful in fine tuning learning/teaching resource. Keep the very short - don't want to keep hearing the same individual talk about themselves again. Very helpful to share and receive feed back from other group members.

C. Technology sharing sessions

- Technology show and tell - thanks for adding this - I would have liked more time to see all of the presenters lots of good stuff
- Technology show n' tell - the actual "showing & telling" was getting hard for me to focus on by the time - so I thought it was too much/too formal as planned. But I then became engaged in an "off topic" discussion of teaching issues several of us shared, and that was great! Plus I can see all that later in BEN ... no need to see it now that could happen in mentor groups if people wasn't specific feedback on their resource. There was a "nomenclature" issue - next time perhaps clarify "goal", "objective", and "format". "What will success look like" seemed to be interpreted in a variety of ways...
- I wasn't able to see all the technology sharing sessions, but the ones I saw gave me ideas I can use.
- I loved the show and tell, technology sharing - I wish I could have attended every sessions and that best practices would have been integrated into it.
- Technology Sharing (show and tell) gave us more resources to tap and the presenters were generous in their offers to share the resources even before these are put up on the portals.
- Technology - Would include individual presentation in future institute

D. Breakfast sharing

- Sharing at breakfast was probably too short a time a lot of ideas didn't have time. This is also an exercise that could be done on list serve or with open computer (projector) to show things - even the non web idea (scratches) has a website.

E. Presentations to group

- Maybe will be more useful if ideas on cards distributed...I don't remember all.. The most useful aspect of this was the deadline it forced on participants. The difficulty was if a participant wasn't following the "outline" for presentation, the 10 minute limit quickly ran out and the important information wasn't covered. (In 2 cases this happened)
- Would have liked an opportunity to have time to see others. Nice to have others work, but not some there was much feedback - don't really have any suggestions as to how it could be improved
- Very helpful in fine tuning learning/teaching resource. Keep the very short - don't want to keep hearing the same individual talk about themselves again. Very helpful to share and receive feed back from other group members.