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NSF Advanced Technological Education (ATE)
Principal Investigators
Garnering Useful Instruction on Developing [Project]
Effectiveness
(ATE PI GUIDE)

Across the set ATE program tracks, the more successful projects are those where principal investigators (PIs) have not only acquired core knowledge in areas relevant to their project's goals, but also acquired key skills in project management and change leadership. PIs new to complex projects may not possess these skill sets, and although mentoring could enable them to build such skills, it would be an immense task to arrange individual mentorship for each of the new PIs. Nonetheless, across the set of new and current PIs it may be possible to find a means to approach mentoring through the use of general workshops and technological means. With this in mind, we are developing a project web site for use by new and continuing ATE PIs that will include video clips of experienced PIs discussing scenarios built around real challenges in project management and change leadership. The web site will also feature a moderated electronic community of practice.

Introduction

Across the set of Advanced Technological Education (ATE) program tracks, the more successful projects are those where principal investigators (PIs) have not only acquired core knowledge in areas relevant to their project's goals, but have also acquired key skills in project management (managing people, funds, and schedules) and change leadership (inspiring others to work toward a clearly defined goal away from the status quo). PIs new to complex projects, irrespective of their success with simpler projects, may not possess the skill sets required to optimally implement project management and change leadership strategies in more complex projects. Mentorship is a well-established academic strategy for building such skills, and typically such mentorship is conducted one-to-one or one-to-many. However, it would be an immense task to arrange such personalized mentorship for each of the new PIs within the various tracks National Science Foundation (NSF) Division of Undergraduate Education's (DUE) ATE program on an individual basis. Nonetheless, across the set of new and current PIs it may be possible to find more time- and cost-efficient means to approach the task of mentoring through the use of general workshops and technological means.

Our fundamental assumption is that there are answers to key questions as well as guiding strategies that experienced PIs can share with novice PIs to significantly aid their ability to successfully achieve the goals of their projects. Our primary activities were the organization of a discussion session at the October 2010 ATE PI meetings and the establishment of an interactive web site for PI guidance. The discussion session featured senior ATE PIs discussing fictionalized scenarios of key issues in day-to-day project management and leadership. Fictionalized scenarios were used to encourage frank discussion among both panelists and attendees. In order to provide a continuing resource for those in attendance as well as those unable to attend the PI meetings, we are developing a website that will feature: (a) at least 10 short video segments of the experienced PIs discussing fictionalized scenarios focused on project management and change leadership (b) twelve written scenarios developed from confidential individual

conversations with 20 highly experienced ATE PIs, and (c) a moderated electronic community of practice to build peer mentoring networks among novice and experienced PIs. It is expected that these tools will also be useful to prospective PIs and those recently declined for awards. The variety of materials to be offered on the site (text and video) can be expected to appeal to a variety of learning styles.

In collaboration with ATE staff, we developed desired "learning outcomes" for knowledge, skills, and abilities to be developed by new ATE project PIs to enhance their project management and change leadership skills. These learning outcomes framed the interviews with ATE project and center PIs. The learning outcomes then led to specific interview questions to highlight the most common and relevant project management and change management challenges likely to be faced by new ATE project PIs. The list of questions is in the Appendix. Senior ATE PIs were interviewed using hypothetical case studies and three guiding questions:
1) In addressing this scenario, what additional information do you wish you had?
2) Given the scenario, what advice do you have for the PI?
3) How would you advise the PI to avoid this situation in the future?

The video summaries gathered from successful ATE PIs will be broken into short 90 to 120 second segments indexed to specific questions and challenges. Website users will be able to either search a specific question and view the answers given by several different PIs or search one specific PI and watch his/her answers to all the questions. Videos will also be organized based on the scenario under discussion, allowing users to determine the combination of information that best suits their needs. Transcripts of the video segments will provide for web site features that are compliant with the Americans with Disabilities act. Written summaries will be prepared for each segment providing (a) background, (b) challenge or question, and (c) questions for consideration in adapting the information to viewers' local circumstances.

The PI GUIDE website will be a multi-purpose online community hosting content, discussions and information for the ATE grantee community and registered users of the site. It will have the following features:
- Support of user-initiated discussion groups on various topics related to project management and change leadership.
- Sending of updated information and content to registered users via "push" technologies such that
  - Users will learn about updated content on the site without having to visit the site.
  - Users will receive messages when new content is added, prompting users to visit the site.
- Accessible site templates, videos, and content (Section 508-compliant).
- Posted videos accompanied by transcripts and additional explanatory material.
- Comment sections on the posted videos and other resources.
- Users will be able to create and manage their own profiles with functionality similar to that of other community-based sites.
- Users will be able to create their own groups based on subjects of interest (e.g., subgroups devoted to [a] new PIs interacting with experienced PIs, or [b] experienced PIs strategizing on needed new directions in the overall program).
- Users will be able to create their own blogs.

The ultimate aim of the website is to provide demonstrable value to potential users through the provision of desired information and/or services. With that in mind, a video server will be added to the site and the site will allow the users to interact with their existing social networks without leaving the PI GUIDE environment. The website will also be able to support the provision of webinars on topics related to project management and change leadership and will support RSS feeds. The site users will also be able to create their own resource library (e.g., documents to share, external web sites, recommendations on consultants, etc.), will be able to personalize their home page, will be able to chat live with other users (both new and experienced PIs), and will be able to share links and bookmarks with other users. Although users will be required to log-in, membership is free and all aspects of the site will be available to all users. Sample wireframes for the website are shown in Figures 1 and 2.

This presentation will summarize the project findings and showcase the website features as they exist at the time of the ASEE meeting.

Figure 1: Sample Log-In Page.
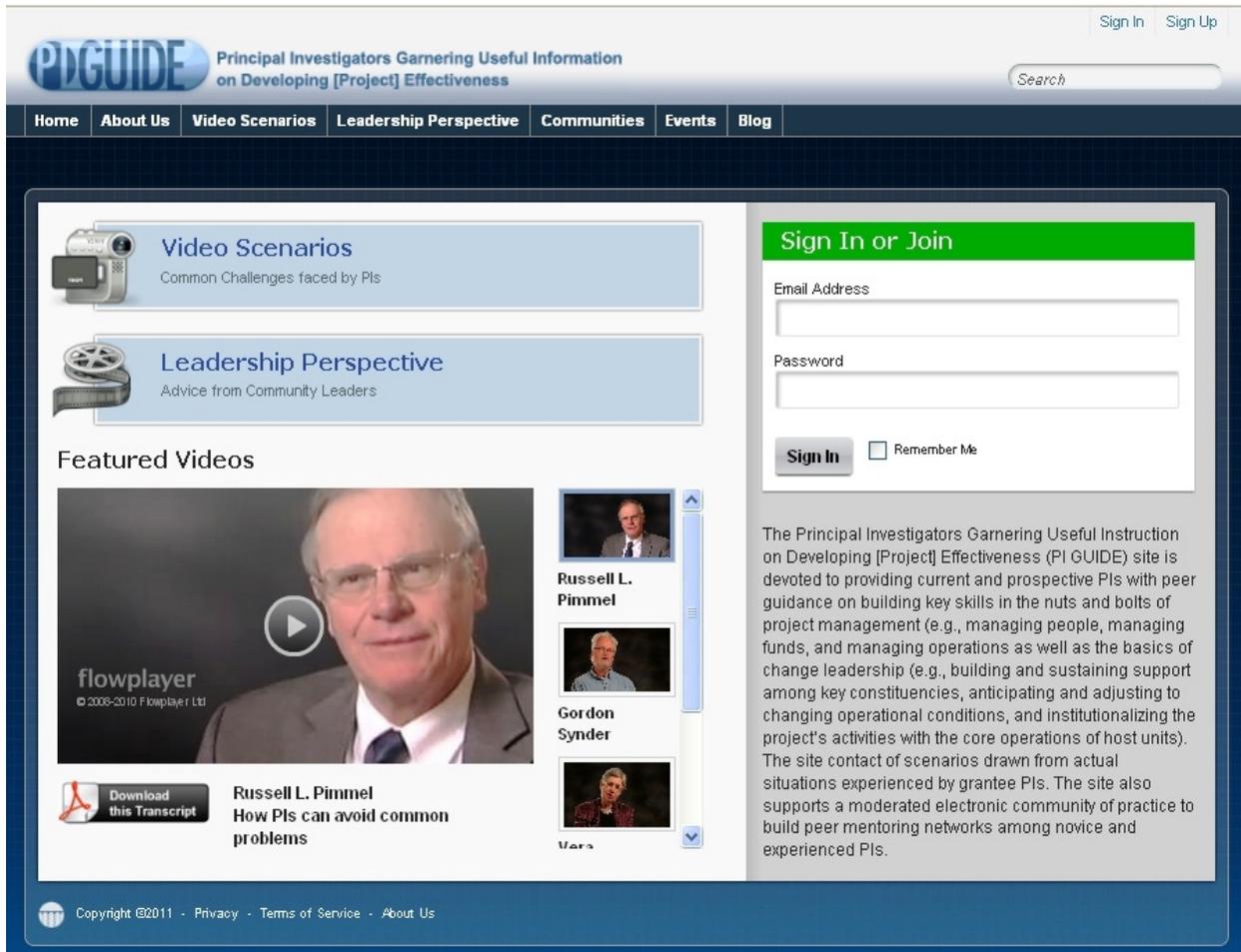
Figure 2: Sample Video Scenario Page (top and bottom).

Acknowledgement

Appendix
PI Interview Questions for
Project Management and Change Leadership

Project Management
1. What do you wish you knew about project management before you had started your project?
2. Were there any unanticipated challenges in forming your project team, or in maintaining your project team over time?
3. How did you deal with the "administrivia" of paperwork and reporting to your administration, to NSF, etc?
4. Did you and do you feel you have adequate support for financial reporting, staff oversight, etc."
5. Comment on any challenge you faced and how you overcame them related to any of the topics below:
   a. Program effectiveness and responsiveness to the needs of academic and business partners,
   b. Center/project start-up and operations,
   c. Curriculum materials development and/or design,
   d. Professional development,
   e. Effective marketing and dissemination,
   f. Budget management,
   g. Grant management,
   h. Effective partner relationships,
   i. Advisory board relationships,
   j. Educational partnerships development and productivity (university, community colleges, K-12, associations, public agencies, commercial vendors, etc.),
   k. Industrial collaboration and involvement (curriculum development, internships, professional development, joint initiatives, and similar activities for students and faculty), and
   l. Transitioning from ATE project grants to ATE center grants.

Change Leadership
6. To achieve the broad goals of your project, what change leadership strategies did you have to pursue? Who had to be convinced, of what, and how?
7. What strategies worked best to achieve your aims?
8. Did you need different strategies for different constituencies; if so, please explain?
9. How does the answer above change with respect to
   a. stakeholders within your department,
   b. outside your department but within your college,
   c. your college, but within your institution, and
   d. outside your institution?