

III. QUALITATIVE FINDINGS

Selecting Workshops to Visit

During the summers of 1997 and 1998, SRI researchers visited four and eight UFE workshops (and related activities), respectively. Three of the 1997 visits were to follow-up activities to prior workshops, and one was to the second year of a workshop that met during three summers. Using information from the preliminary visits as a guide, a round of visits to workshops in progress was conducted during the summer of 1998. These visits focused on gaining in-depth qualitative knowledge about: (1) the workshops *per se*, including their intensity, types of activities, and quality (for which a content expert accompanied the SRI site visitor; see list of experts and their affiliations in Appendix D); (2) the participants, including their motivations for attending and their reactions to workshop activities; and (3) the workshop’s leadership, including what the leaders hoped to accomplish and how and why they had arrived at the particular format and activities they were using.

Within scheduling constraints, sites were selected to vary in terms of disciplines, foci, geographic regions, and types of participants targeted. We also sought to include workshops of various lengths. Exhibit III-1 shows the workshops visited in 1998.

Exhibit III-1. UFE Workshops Visited in 1998				
Name of Workshop	Focus of Workshop	PI's Institution	Length	Targeted Participants
The Art and Science of Model Building: A Workshop for College Mathematics Teachers	Content and teaching methods	University of Montana, Missoula	2 weeks	Mathematics faculty
Teaching Teachers to Teach Engineering (T ² E)	Teaching methods	United States Military Academy, West Point	1 week	Engineering faculty
Undergraduate Faculty Workshop in Computer Networks	Content	Michigan State University	2 weeks	Computer science, especially from HBCUs*
Undergraduate Faculty Program of the Institute for Advanced Study/Park City Mathematics Institute	Content, teaching methods, technology	Institute for Advanced Study, Princeton University	3 weeks	Mathematics faculty
Molecular Genetic Analysis Applied to Evolution, Ecology, and Systematic Biology	Content, laboratory techniques, technology, teaching methods	San Francisco State University	2 weeks	Biology faculty without expertise in molecular biology
Using Mathcad in Teaching Physical Chemistry	Content, technology, teaching methods	University of South Alabama, Mobile	1 week	Physical chemistry faculty
Innovative Physics Experiments for Beginning College Faculty	Laboratory methods, technology, teaching methods	Winston-Salem University	1 week	Physics faculty from HBCUs or Hispanic-serving institutions, nationally or from small colleges in the South
Image Processing Applied to Classroom Teaching	Technology	Foothill College, Los Altos, CA	1 week	Faculty from any discipline, especially community college faculty

* Historically Black Colleges and Universities.

In the spring and summer of 2000, we contacted the eight workshop PIs and many participants by telephone and/or e-mail to learn about participants' postworkshop experiences. Appendix F presents summary reports of the eight workshops visited in 1998 and information we learned from our follow-up contacts.

In the remainder of this chapter, we present summary observations from the eight workshop visits.

Workshop Focus

Consistent with findings based on quantitative data presented in Chapter II, the qualitative data indicate that most of the eight workshops dealt with transforming the classroom in more than one dimension. Seven of the eight were designed for faculty to change the content, lab techniques, and/or technology of their courses. Five of those seven also had a heavy focus on teaching methods; the eighth was dedicated almost entirely to teaching methods.

Workshop Length and Intensity

The durations of the workshops ranged from 5 days to 21 days. The appropriate length for a given workshop depended principally on its learning objectives and also, to an important degree, on the availability of speakers, specialized equipment, field sites, and classroom space. At least as important as those factors was participants' ability to fit the workshop into their schedules.

Almost all PIs whom we visited stated that they would prefer to hold longer workshops so that they could cover subject matter more in depth, engage in more hands-on learning activities, and/or have more time for participants to develop materials and plans for their own courses. However, PIs also indicated that they were aware that faculty's time was scarce and that most faculty had many other responsibilities during the summer. PIs who had experimented with various lengths of workshops indicated that if a workshop was too long, many potential participants were unlikely to apply.

Most workshop programs were of high intensity, with some evening sessions and/or demands for participants to fulfill in the evenings. Though in many cases tired by the end of their workshops, participants appreciated the high-intensity experience. The one nonresidential workshop we visited had considerably shorter hours than the residential workshops, to allow for long commutes.

Balance of Workshop Activities

In most workshops observed, the types of activities were well balanced, and participants were highly engaged at all times. The optimal balance included some lectures or presentations involving interaction with participants, programmed hands-on work, sufficient time for participants to work on materials for their own courses, and time for social interaction among participants. Where one of these elements was missing or short-changed, it was challenging for participants to get as much out of the workshop. However, clearly, balancing the various types of activities was easier for longer workshops.

Most workshops did not include many traditional lectures. There was one exception, in which, when faced with the decision of balancing various types of workshop activities versus covering more content in lectures, the PI decided to sacrifice modeling good teaching methods in favor of packing the workshop with the maximum content information. Although participants who were interviewed appreciated the breadth and depth of content, they indicated that their attention waned somewhat during some of the lectures.

In some cases, because of time limitations and/or workshop structure, the amount of time allowed for participants to work on their own projects was inadequate. In several of the shorter workshops, only about 5 hours was scheduled for this sort of work. Clearly, how long a workshop should allocate for participants' work depends on the difficulty of their tasks. For example, less time is needed to develop a simple experiment based on principles that participants already know, whereas more time is needed to employ complex new content and/or technology to develop an entire new module.

Workshops also varied in the amount of time they allowed for free-flowing interaction among participants. Such opportunities ranged from breaks between classroom or laboratory sessions to dinners to field trips with a mix of educational experiences and social interaction. Participants indicated that such interaction was very beneficial, stating that casual conversations often turned to topics that they had not previously considered but that were important to them.

Recruitment and Selection Strategies

Recruitment strategies included mailing information packets to department chairs and deans across the country, sending special brochures to selected audiences such as faculty at Historically Black Colleges and Universities (HBCUs), making personal contact with institutions in a state or region, placing notices or advertisements in professional association publications, and posting announcements on Web pages and Internet discussion lists. Participants also reported hearing about a workshop from earlier participants, receiving a special invitation from the PI, or being “tapped” by their deans or department chairs.

Participants often were required to submit a resume, letters of support or recommendation, a statement of reasons for wanting to attend, and, in some cases, a proposal for their workshop project. Although it is difficult to generalize from the few cases observed, it appears that the participants’ stated reasons for wanting to attend were very important to the selection process.

Participant Demographics

Four workshops had from 13 to 15 participants, and the other four had from 21 to 28. The proportions of women ranged from 13% to 32%, with an average of 25% across all eight workshops (in contrast to 30% for all UFE workshops from 1991 to 1997, as reported by PIs).

Despite many PIs’ attempts to recruit participants from underrepresented minority groups, few such faculty attended the workshops (NSF’s definition of “underrepresented minority groups” includes African Americans/Blacks, Hispanics/Latinos, American Indians, Alaska Natives, and Pacific Islanders but *not* Asian Americans or Asians). Three workshops had no participants from underrepresented minority groups, and the rest had no more than three such participants. Of the 156 participants in all the workshops visited, 11 (7%) were from underrepresented minority groups.

When asked why so few faculty from underrepresented minority groups attended workshops, PIs indicated that they were unsure but offered the possible explanations that (1) there were relatively few such faculty to draw from; and (2) minority faculty tended to be relatively junior, so that, possibly, many were unable to attend workshops because

of heavy responsibilities of other types, such as taking on extra work to pay off student loans or responsibilities concerning new families with young children.

In most workshops visited, participants began with similar levels of prior knowledge, according to PIs and site visitors' interviews with participants. Where prior knowledge levels were too different, some participants were not able to take advantage of part or most of the workshop. This was a particular problem at single-discipline workshops that included individuals not steeped in the discipline (e.g., K-12 teachers) and at multidisciplinary (not interdisciplinary) workshops, in which case participants tended to understand presentations that related to their own field but got relatively little out of presentations related to other fields.

The most important point that can be made about participants is that the vast majority of them were extremely eager to learn and to apply what they learned. In a few cases, their eagerness was robust in the face of some poor presentations or a less-than-optimum workshop schedules.

Presenters and Staff

Most of the time, presentation methods and materials were of very high quality. In a few cases, however, presenters (typically content experts) were not sufficiently skilled to tailor their presentations appropriately. For example, toward the beginning of a presentation by a research scientist, some participants indicated that they did not understand his use of several technical terms. When it became apparent that reaching an understanding would take some time, the scientist decided to continue with the rest of the presentation rather than resolve the definitions. As a result, about half the participants could not follow the rest of the presentation.

In several workshops, computer lab demonstrations were led by staff who were experts at the software but not skilled at handling an interactive demonstration. These sessions were somewhat chaotic at times, with some participants paying little attention to the presenter and others trying hard to follow.

Important factors in workshop success were the number and quality of staff providing assistance for participants as they worked on assignments or their own projects. In the best cases, there were sufficient staff who acted as mentors and were in constant contact with their participants throughout hands-on activities. In the worst case, one or

two staff walked around the room, answering questions only when asked, rather than actively checking how participants were doing and assisting them. In one case, a site visitor sat with a participant who was supposed to be working on a project but who was completely lost, not asking for help, and not receiving any.

Follow-up Activities

PIs and participants were active in creating and pursuing follow-up activities. Examples originated by PIs included later sessions specifically to ensure that products were completed, critiqued, and disseminated; offer of a small matching grant for equipment purchases; continuing technical assistance by e-mail; and placement of completed exercises on a Web site. Scheduling formal follow-up activities could be somewhat difficult, however; one PI had to cancel his planned follow-up activity because no dates could be found during which a critical mass of participants could attend.

Summary

The eight workshops visited ranged from 5 to 21 days. PIs attempted to find a length for their workshops that would be sufficient for participants to learn the material and do hands-on work, but not so long as to be burdensome for participants. All of the eight workshops included presentations by staff and/or guest lecturers, hands-on activities (including time for participants to work on materials for their own courses), and opportunities for participants to interact with each other. Several workshops also included field trips.

Most workshop presenters did an excellent job, according to expert site visitors and participants interviewed. In general, the few exceptions to this rule were content experts who either gave formal lectures or were not able to adapt their presentations to the participants' level of knowledge. These situations typically were the only cases in which participants were not highly engaged.

A majority of the participants at the workshops visited were white males; across all eight workshops, about a quarter of participants were women. Participants from underrepresented minority groups constituted only 7% of all participants in workshops visited, despite PIs' attempts to recruit them.

Face-to-face follow-up activities proved somewhat difficult to schedule. Of the eight workshops visited, only one intended to schedule a formal follow-up activity, but it

was cancelled. Informal gatherings at meetings were a more successful strategy and were held by three workshops. The most common type of follow-up was for participants and workshop staff to continue to communicate with each other during the year after the workshop, as participants continued to work on their materials.