National Teacher Policy Institute
<http://www.teachnet.org/ntpi/>

Technology Use Report

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Bram Moreinis
Technology Coordinator

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EXECUTIVE SUMMARY: Findings and Recommendations from Survey Data

This report explores and analyzes the responses of twenty out of thirty-five National Teacher Policy Institute MetLife Fellows to their project's Technology Use Survey, an instrument available on the project website at <http://www.teachnet.org/ntpi/ntpisurv.html>. The survey contained three sections:

> 1. Rating the technical support Fellows received for their work in NTPI
> 2. Assessing the use of project technologies, and
> 3. Assessing the value of the web-based bulletin board (BBS) for collaborative policy analysis.

This report is intended to provide tips and caveats for future IMPACT II projects that rely on technologies for remote collaboration of teachers for research, analysis, and policymaking.

SURVEY FINDINGS

Local Trainings are Critical for New Users.   The degree of acculturation to various remote communications methods determines how effectively support messages will be received and interpreted. Local support to establish a base level of communication in email, the listserv (the conventions of which seems particularly difficult to apprehend), the web, and the bulletin board should precede remote support, which could then focus on using those tools to refine skills and direct work. In future projects, funding and coordinating local training sessions is recommended.

Local Technical Support in Configuring Older Machines is Needed. The most significant barrier to participation for some Fellows was inadequate or misconfigured machines. There was no way for Fellows who had never tried web browsing on older machines to know what they were in for in tooling up for it. As new users attempt to master the skills of new technologies, they are unable to distinguish between their own errors and problems with their equipment and software configuration. In future projects, coordinating sufficient technical support to guarantee necessary access is recommended.

Mastering New Technologies Can Be Considered a Professional Responsibility for Teachers. Teachers nationwide can be more accountable to one another when their ideas are developed in the open conversation about teaching/learning enabled by electronic bulletin boards and the web. If teachers are going to take on the role of policy making, they will need the leverage these technologies provide to obtain the highest quality and efficiency from their collaboration.

Technical Problems Adversely Affected Participation for Some Fellows. Problems with America Online (inability to access the Web during peak traffic, old browsers incompatible with Web-Based Forms) and with Bulletin Board (BBS) Software Configuration (various difficulties customizing the interface, a template from Allaire Forms hosted by SohoNet) resulted in less consultation and commitment to the BBS. However, a majority of respondents experienced some value from the BBS for their work, and many are quite enthusiastic about the medium.

Position Paper Affinity Groups Could Have Been Emphasized More. Conference calls organized by topic, web pages linking affinity groups member profiles with their threads and online resources, and supporting group submission of policy papers might have improved the quantity and depth of peer review.   The degree of central coordination necessary to accommodate this would be substantially higher than current staffing levels permitted, however.

The Kickoff Videoconference Was Effective In Establishing Group Culture. The overwhelming majority of responses to the videoconference as an experience were positive. In particular, the role of face-to-face contact as an opportunity to build a sense of community was mentioned—this was, in fact, the primary reason for exploring videoconference technology, which proved very challenging to coordinate.

Fellows were Enthusiastic about the Web as a Research Tool. Many comments expressed delight in discovering and developing the capacity to find and share information via email and the web. Despite some technical difficulties, NTPI, IMPACT II's first nationwide teacher policymaking initiative, provided effective teacher professional development and experience supporting Internet use for policy analysis and collaboration.

INTRODUCTION

The National Teacher Policy Institute is designed to provide teachers in six sites across the country an opportunity to develop policymaking skills. As an institute, it established a forum, within specific structures and time frames, for addressing the most critical concern of the profession—the quality of professionals entering and remaining in teaching.

The remote collaboration necessary for the work of the NTPI Fellows is maintained through an array of eight communication technologies: "snail mail", faxes, telephone conferencing, email, a listserv, a web site, a web-based bulletin board, and videoconferencing. Experience with these methods varies enormously among teachers, and the time, resources and local support required for a necessarily sharp learning curve also varied between the six sites. With a modest budget, NTPI could not provide its participants with computers or Internet accounts, or fund local training sessions. Though the project relies on a host of skills and degrees of computer access to achieve its ambitious goals, meeting these objectives is the result of flexible strategy, patience with Research and Development (R&D), dedication and volunteerism, and lucky coincidences of needs and sources of help.

Various combinations of communication tools have been explored to offer the highest degree of participation by sites with very different facilities and degrees of technological experience. For example, a videotape of Ann Lieberman was mailed and viewed by all sites as a prelude to a six-site CU-SeeMe "kickoff" videoconference, with sites connected to Ann (who was in a hospital bed, suffering from a broken ankle) via ISDN, T-1 and T-3 at various locations simultaneously using speakerphones to conference call. The survey of NTPI Technology Use which provided the data for this report was designed for web-based forms submission, but was also sent via email, and some responses were returned via fax. To almost every strategy employed in NTPI, responses ranged from elation to despair.

METHODOLOGY

To assess the use of these various communication technologies in this project, a three-page survey was designed and made available on the Web at <http://www.teachnet.org/ntpi/ntpisurv.html>. The survey contained three sections: first, an evaluation of the technical support received; second, an assessment of technology use changes and comments in relation to efficiency and power; and third, an assessment of the value of the project's central technology, the web-based bulletin board, for collaborative policy analysis. What follows is an analysis of data gathered from this survey mentioned above. This report is intended to provide tips and caveats for future IMPACT II projects that rely on technologies for remote collaboration of teachers for research, analysis, and policymaking.

SURVEY RESPONSE LEVELS

Out of 35 Fellows, 20 responded to this survey in time for inclusion in this report (two submitted responses past the deadline, which were not included). Although there were many ways to receive or submit the information, responses were solicited by email only, and those who did not check email during a two-week period would not have learned of the survey. The following chart lists responses by site.

Site	Responded by 5/28	Didn't Respond by 5/28
New York, NY	Casey, Clinkscales, Fenton, Dillon, Hom, Wyns-Madison	Cooper, Dahill-Fuchel, McGill, Rafter
Fairfax County, Virginia	Horn, Portwood, Thomas, Yalen	Wagoner
Boston, Mass.	Berriz, Hoyt	Diokno,Pappas
Chicago, Ill.	Becker, Johnson	Regan*, Reichman-Crowley, Cherkasky-Davis
Santa Barbara County, CA.	Scott, Swanitz, Wiezorek, Williams	Kent*
Los Angeles, CA.	Klemp, Takenaga-Taga	Barker, Kagan, Roderick

Responded after the deadline—data not included in this report

While the responses to this survey do not include the input of 15 Fellows, they do form a representative sample that includes the technologically literate and the novice, and representation from all six sites.

THE NTPI TECHNICAL SUPPORT MODEL

The "chicken and egg" problem of providing support for the use of communications technologies through those technologies was the signature challenge for NTPI. Web pages were created that offered a host of guidelines and tips, but how could everyone be made to visit them, when many NTPI Fellows had never accessed the World Wide Web before? Listserv messages with helpful instructions could be broadcast, but only to those who had email accounts which they checked regularly, and who could follow the instructions to subscribe. In addition, the degree of acculturation to these various media determined how support messages would be received and interpreted, and therefore how effectively they could act as pointers or primers.

Each of the six NTPI sites had site directors who were entrusted with some degree of coordination responsibility for bringing their team up to a base level of participation, though this responsibility was to a degree voluntary and not equally undertaken by all. Some directors were very facile with email and able to take leadership; others were not. Some sites were fortunate with "tech gurus" as part of the team; others had alliances with universities that made their facilities and expertise available; others did the best they could with whom they had.

The balance of remote and local support was therefore different for each site. Once a base level of networking could be established among each site team (everyone using email accounts which they check frequently, subscribing to the project listserv, meeting once a month and participating

in telephone conference calls, accessing the web and project bulletin board either at home or at school) the supplemental skills of composing appropriate postings, distinguishing between email, listservs, and bulletin boards, and finding the most valuable resources for work in the least time possible could be coached from NTPI headquarters in New York. Ideally, local support to establish a base level of communication would have preceded remote support, using those communication tools to refine skills and direct work.

But establishing this base level was, itself, a serious hurdle to clear. For those that never mastered it, remote support could not be fully effective. There were no full-time staff members ready to receive technical support phone calls, so email (and a small degree of phone tag) had to suffice. Using email to explain how to execute complex operations in an unfamiliar medium has the quality of trying to teach a youngster how to tie his shoes over the phone. Time, as everyone now knows, is the scarcest commodity for teachers, and the perception that it was being wasted trying to learn something without sufficient support or background information is not pleasant, or in some cases, even acceptable.

BALANCE OF LOCAL AND GLOBAL SUPPORT
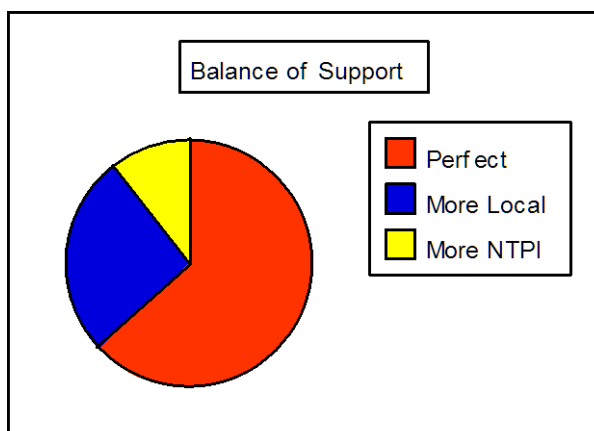
Support for "Net Newbies"

In their responses to the technology survey, NTPI fellows addressing the issue of local and global support, describing a range of degrees of preparedness for the project. They also shared some of their intense frustrations.

For those who needed a great deal of hand-holding, a failure to find strong support locally would have provided a significant barrier to participation.

The provision of technical support for "newbies" requires a degree of caring and hand-holding that could not be provided over email. As the following accounts indicate, first experiences with NTPI were unpleasant for many:

> "In the beginning of the project, I felt a little afloat and adrift. I was not ready to use the technology fast enough and felt very intimidated by the process, as if I were afraid to make a mistake and allow myself to look incredibly stupid....[A]s there were many people needing help, it was difficult to get a sense of the coordination of efforts. I felt like a baby who wanted her bottle now, but could not get it."
>
> - Margaret Hoyt, Boston

Hoyt's comment implies that better planning for supporting newbies in this start-up period might have mitigated the frustration of the inexperienced participants. Others concur:

> "Some teachers are afraid of or don't understand electrical-technological stuff, so they shy away from it. We (they) might benefit from hands-on technological education that is not delivered by the rapid-fire method. So I guess a major challenge might be to become more technology friendly, or overcome fears of technology and advance from there."
>
> <div align="right">-Francine Johnson, Chicago</div>

What other choices could have been made? An "Information Highway Onramp" was available as an email and web training course in mid-summer, but this suffered from the chicken-and-egg problem mentioned earlier. For those across the country who had not mastered email and lacked web access, little could be done from New York City. And in any event, face-to-face contact was needed to soothe the anxious adult learner. The terms "baby steps" and other baby references made in these responses indicate a sense by participants that emotional support was needed at this stage.

As many of the respondents indicated in their comments, organized local training sessions would have made a big difference. This would have required all site directors to ensure that such sessions would be identified and attended by newbies on their teams in September. Such an expectation, however, was beyond the scope of the "job description" (and compensation level) for the site directors. Individual initiative was required from the NTPI Fellows to master the technologies needed to participate, an expectation that was spelled out in the registration forms for the project, as quoted below:

> "We are also seeking teachers who are technologically literate. Access to a computer with adequate memory and speed, a modem with adequate speed, a phone line, and an on-line service—all at home or at school—is necessary for participating in NTPI. Institute participants will communicate regularly on-line and conduct much of their work on-line throughout the course of the institute."

Later, in a bulleted list of requirements for selected Fellows, applicants agreed to "become members of an on-line electronic community." In the check-off list of commitments, they were also asked to agree that "I will participate in an on-line course to be held in August 1996 in preparation for NTPI. I have access to the necessary equipment to participate on-line on a regular basis. I will check my email at least twice weekly."

While frustration is understandable, it cannot be said that Fellows were not warned of the level of technology use the project would require. Because of the wide range of levels (and few number of responses received) the on-line course was not provided; in place of it, the technology coordinator was available for extensive support via email (and to a degree, telephone) during this startup period to help participants get online and on the Web. The "Technical Support Onramp" from the project website was designed to serve as a guide for those who succeeded in accessing the Web, and the listserv, NTPI-L, was used in addition to email to help Fellows navigate the site. But the chicken-and-egg problem of accessing support for email and the web that arrived via email and the web limited the scope of this strategy, and it became clear (to some) that local help would have to be found. Some took that initiative:

> "I went on my own for training and support with local sources (in the meantime my school has done some of this, but I didn't want to wait) and emailed Bram with specific

questions or issues, or was able to figure things out on my own. This was not so for many of the others in my local site. Also, for me, and I believe many others, though they are unaware of this, a big part of the difficulties are the hardware/software intricacies."

-Jean Becker, Chicago

In this response, Becker mentions perhaps the most significant barrier to participation—inadequate or misconfigured machines. Remote support could not cope with most problems of this kind: the troubleshooting of hardware and software, particularly of "dinosaur" machines not designed for web browsing, is almost impossible to do without an expert examining the machine in question, performing a range of diagnostics and installations. But despite the warnings in the application, there was no way for Fellows who had never tried web browsing on older machines to know what they were in for in tooling up for it; and, not being used to problems they couldn't solve, they were deeply affected by the situation:

"I felt so many times that I needed my own computer at home as depending on the lab at school (which was not in working order most of the time) caused me great frustration. I always felt behind in my understanding and technical abilities. I hated being an "underachiever."

-Linda Wiezorek, Santa Barbara, CA

"In Oct. I could hardly get on line without the computer freezing. My hardware was not ready for the Internet until I increased memory, purchased modem and online fees, and learned the system. Remote's support was then adequate."

-Lynda Williams, Santa Barbara

Once Fellows had achieved a base level of access and skill, however, most felt that the email and web-based support provided remotely by NTPI staff was adequate. Particularly for those with previous experience (the New York City Teacher Policy Institute (TPI) had prepared the NY team for these technologies), remote support served well:

"Because we had figured out some of this stuff last year in TPI I felt rather comfortable."

-Peter Dillon, NYC

"Bram, Sanda, and Ellen were very helpful and patient in aiding me with any technology questions I had. The members of the NYC NTPI were also very supportive, especially Peggy."

-Alice Hom, NYC

"Whenever I needed help or support, it was available either from other fellows at my site or from Sanda or Bram."

-Carol Horn, Fairfax County, VA

"I was particularly impressed with the immediate help and advice available to me from Bram and NTPI with technology issues."

-Kristi Thomas, Fairfax County

One factor in predicting which teachers would make it through the difficult "Onramp" stage was their felt sense of the importance of mastering these technologies. They demonstrated a willingness to respond to such challenges not for the sake of a project which required a great deal of time and offered little monetary compensation, but for the sake of their professional lives:
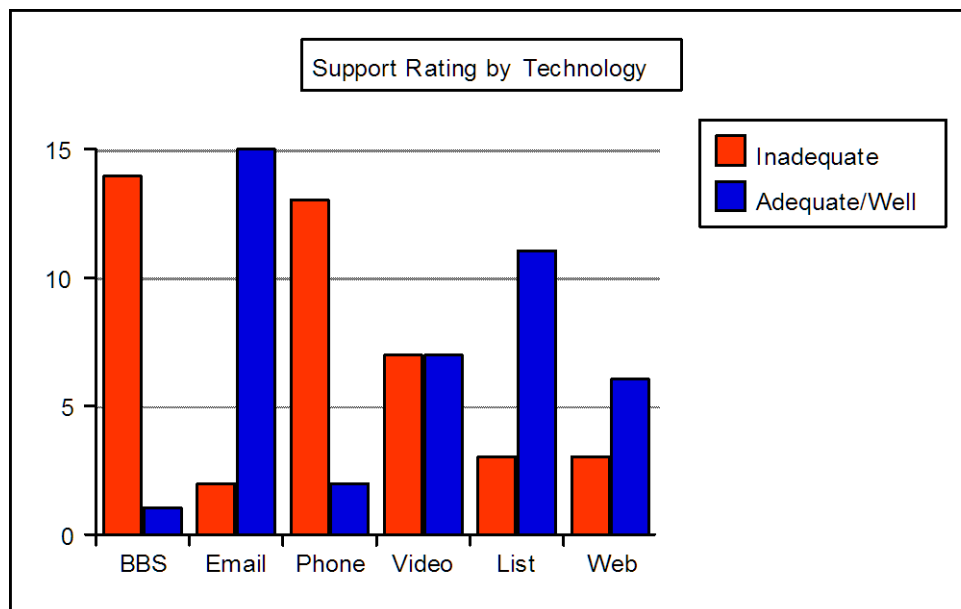
> "I am an educator just entering the technology of the WWW. My knowledge base of computer/Internet technology is very limited, however, my desire to use this technology to meet the challenges of educators and students is very great. I feel confident that we will all find this medium accessible.... I am teaching summer school so that I can buy what I need to continue my technical learning. I'm not sure that the reason everything took me so long was my fault, the fault of the computer or of the limited knowledge of the person helping me. I just know that many times I felt so frustrated and tempted to quit. I am interested in understanding the technology but sometimes it seems so overwhelming."
>
> -Linda Wiezorek, Santa Barbara County

RATINGS OF TECHNICAL SUPPORT LEVELS

Given the range of needs and experience among the Fellows, the type and degree of technical support for the various communication tools varied widely. In an ideal setting, support should be progressive: those unfamiliar with conference calls would be prepared by personal calls ahead of time; personal and conference calls would be held for those unfamiliar with email until they knew enough to participate in a listserv-based course on the use of the web; those new to computers would receive in-person training until they knew how to access their software, etc.... Components of such a strategy should be considered for future projects of this nature (if they are funded at significantly higher levels than NTPI was), because a great deal of frustration and potential opting out might have been thus avoided.

The graph below indicates how well supported the 20 respondents felt in each of the communication methods. "BBS" refers to the web-based Bulletin Board that was a new technology for most everyone; "Phone" refers to the conference calls that involved from 10 to 25 participants at a time, "Video" refers to the videoconference that kicked off the project, which will be described later, and "List" refers to the Listserv, by which one member could send a message to everyone else, provided they had subscribed. (Initially, it was impossible for a proxy to subscribe Fellows if they were not able to do it themselves—this was remedied when SohoNet moved to a "Majordomo" server).

Support Rating by Technology

Legend: Inadequate (red), Adequate/Well (blue)

Categories: BBS, Email, Phone, Video, List, Web

As this graph indicates, a majority of respondents felt inadequately supported by the Bulletin Board (BBS) and the Conference Calls (Phone). In a followup survey designed to assess the inadequacy of the conference call medium, fellows clarified that the source of their dissatisfaction was the content of the calls—specifically, with the lack of depth that can be achieved on an 8-10 person conference call—not the technical support they received in preparing for or participating:

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> "It was the content of the conference calls that was intimidating. I, for one, hate to talk on the telephone (thank goodness for email, caller ID, and voice mail.) As usual, though, once we got started, I found the conference call very informative and helpful."
>
> -Gretchen Portwood, Fairfax County

Because of the intended centrality of the BBS to the project, the displeased response requires special consideration. The Web-based Bulletin Board interface used for the project was a template from Allaire Forms, a "Cold Fusion" application provided by SohoNet, IMPACT II's Internet provider. Evidentally NTPI was the first group to attempt significant work with this interface, and many modifications had to be made throughout the first half of the project to make the it more user-friendly. NTPI users were enlisted guinea pigs, ferreting out the difficulties which necessitated redesign of the interface. It is difficult to provide support for a technology that keeps changing, and these changes will be explored later on in the report to inform future BBS design. However, web-based bulletin boards are themselves very new technologies, and the more reliable and user-friendly proprietary systems (such as AOL and First Class, the choice of many schools) would not have permitted the broadest level of participation without a great deal of additional expense.

As it was, AOL users had significant difficulties of their own migrating to the web-based system.

THE PROBLEMS WITH AOL

IMPACT II began as a conference area on America Online. Because AOL has been very successful as a first provider for Internet newbies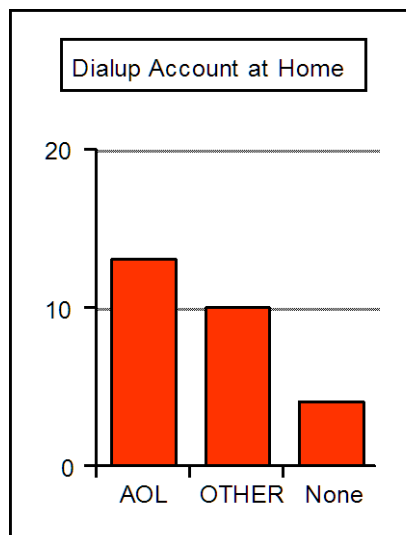, the majority of NTPI Fellows were and are AOL users. Unfortunately, AOL is a proprietary system—incompatible with standard platforms—which caused no end of grief for users and for the technology coordinator.

Unlike the Internet, served by many compatible software applications, AOL requires separate software and, until recently, its web browser. AOL users are rarely savvy enough to download and configure the browser on their own, and once accomplished, reluctant to migrate to Netscape; however, the AOL browser was found unreliable for Web-based communication through CGI forms. This made posting long BBS messages or responding to this technology survey difficult, if not impossible, for many.

As the graph [right] indicates, most NTPI fellows used America Online as their Internet access provider from home, so that any AOL difficulties were widespread in their effects.

Dialup Account at Home

By the end of the project, many Fellows had experienced the tradeoff of relying on AOL:

"AOL has spoiled me, as the user software is so much easier to use than I've found elsewhere." - Ken Barker

"I have tried to use the web more but the technical problems with AOL have discouraged me." - Jean Becker

As the bad news about AOL's inoperability with the NTPI Bulletin board circulated, adding to a sudden difficulty in getting online at a reasonable baud rate (modem speed) due to AOL's now-infamous offer of unlimited Web access to new users at a reduced rate, a handful of NTPI Fellows migrated to standard internet providers (such as EROLS or Connect2) or to their school district servers during the project, which cleared up most of these problems. (For the rest, alternate scapegoats to AOL would have to be found--see "Good BBS, Bad BBS" below.)

Given the difficulties with AOL for CGI-based web forms, the ungainly initial configuration of the BBS, and the distress of having to get work done in a research-and-development (R&D) setting, it was not surprising that the BBS got such poor marks.

TECHNICAL SUPPORT METHODS RATED

Technical support was needed for the use of various technologies, but was also provided through them. Which channels of support were most effective, and if not, why? Votes for specific improvements were cast as follows for technical support offered via:

Telephone	Conference Call	Email	Bulletin Board	Videoconference
No Change=17	No Change: 20	No Change=19	No Change=15	No Change=9
Better Responses=2		Better Responses=1	Better Responses=4	Better Facilitation=6
Faster Callbacks: 1			Faster Responses=1	More Conferences=5

As it turned out, the BBS was not used to provide technical support except in one instance (when a Fellow asked how to post a graphic image to his thread), so it is likely that the four requests for "better responses" had more to do with the content responses to their threads than with the quality of technical support. (Unfortunately, the wording was ambiguous for this item.) However, it is clear that technical support requires a great deal of back-and-forth, and the asynchronous quality of bulletin board messaging makes it a poor candidate for technical support. Web pages function much better as primers, while telephones, email exchanges, and text chats (which were not used in this project, given the unavailability of someone to chat with at any given time) are more appropriate for emergent technical support needs.

Significantly, the role of the videoconference in providing technical support got mixed reviews. First, six respondents objected to the facilitation. Although a section of the videoconference had been set aside for demonstration of using the BBS in conjunction with word processors and other web pages, very little time had been set aside for this purpose, which came at the end of a very long day of new experiences. In addition, the reconfiguration of the videoconference cameras to allow participants to view a sample computer screen as well as each other proved unwieldy for some, impossible for others (who had to listen in on their telephone conference), and this, combined with the necessarily fast pace of the demonstration, was no doubt quite frustrating.

On the other hand, five respondents would have liked to see more technical support provided by videoconferencing. The videoconference was a big event for NTPI, and perhaps the most significant and potentially powerful use of technology in the project. It warrants closer study.

THE KICKOFF VIDEOCONFERENCE: SEPTEMBER 21, 1996

A complete description of the videoconference, through NYC meeting notes taken by Project Coordinator Sanda Balaban, is available on the web at <http://www.teachnet.org/ntpi/vc1/>. This section will not attempt to summarize the proceedings or preparation, but consider the wide range of responses received. As the minutes read, even within the New York team (who hosted the conference and were present in the same room with the facilitators), the reviews were quite mixed:

> "The day concluded with discussion of the videoconference. Rachel stated that it took some getting used to but was worth it. Peter felt that it was too long. He thought the segment with Ann worked well, but suggested that we could have done the same work in a teleconference. Lexi suggested that if the room were set up differently, and we could see all the participants, it would've worked better. Leo stated that it was hard to have a real conversation, and thought the setup worked best when someone was speaking for a sustained period of time. All in all, some thought the video was exciting; some thought it was gimmicky. "

A few participants found the videoconference long, "unfriendly," and perhaps impractical; others acknowledged that the initial "glitches" were understandable and forgivable. The arrangement of simultaneous videoconferencing and telephone conferencing was chosen as a backup, because audio quality can degrade as network traffic varies. One of the difficulties in coordinating this conference was in finding spaces with both high-speed Internet access and nearby phone lines, with appropriate computing equipment and with amplified speakerphones.

> "The Fairfax County group struggled with the videoconference—we were not prepared with a conference call phone which became necessary to improve the sound. I do not know who was truly responsible for the glitches on our end, but I definitely felt we should have been better set up for the event. I did feel that it was worthwhile."
>
> -Kristi Thomas, Fairfax County, VA

Adding to the challenge of Internet videoconference was the key moment in the conference when mentor Ann Lieberman would join from her hospital phone. A successful innovation involved miking the speakerphone in the NY site, so that its output could be broadcast over the CU-SeeMe connection. Even though not all sites were able to set up speakerphones, they could in this way participate equally. This enabled Lieberman to converse with everyone while IMPACT II President Ellen Dempsey facilitated responses using visual cues between the sites.

Although group videoconferencing can be very tricky and uncomfortable (and rarely gets beyond the "making faces" stage in first tries) this effort was by far the most successful and user-friendly CU-SeeMe conference of the five in the author's experience. The overwhelming majority of responses were positive. In particular, the role of face-to-face contact as an opportunity to build a sense of community was mentioned—this was, in fact, the primary reason for exploring videoconference technology, which proved very challenging to coordinate.

> " I loved the videoconference since it helped put a name to faces. Since it was so early in the process I did feel nervous prior to the event."
>
> -Berta Berriz, Boston

> "Teleconference and videoconference are powerful for creating a sense of community."
>
> -Jerry Swanitz, Santa Barbara County

> "I enjoyed both videoconference and conference call experiences. More would have been nice."
>
> -Linda Wiezorek, Santa Barbara County

> "Teleconferencing/video conferencing could be used instead of Saturday meetings."
>
> -Gwen Clinkscales, NYC

> "[I would like to see] Videoconferences from our own computers."
>
> -Lynda Williams, Santa Barbara County

Aside from the technical aspects, the facilitation of group dialog is also tricky business. When 35 people in six sites are all attempting to attend and contribute to a discussion of different topics, it's hard to follow a focus. The facilitator must offer active listening and polite segues, while many other participants may appear to be distracted by lunch or talking amongst themselves. Sometimes participants forget that they're on camera when it's not their turn to speak. Dealing with this facilitation hurdle sometimes requires an apparently heavy-handed approach. Wrote Margaret Hoyt, "The [video]conference could have had a more open discussion. The question is how to facilitate this. I do not have the answer."

Reflecting on the preparation and technical structure of the videoconference, I developed the following tip sheet:

10 TIPS FOR A GREAT CU-SEEME VIDEOCONFERENCE

1) Purchase a conference call number and have all participants make sure they have speakerphones in their videoconferencing rooms.
2) Use a Videolabs Camera, not a QuickCam— and a pair of extension speakers. You'll need one of the new Power PC's in order to have enough audio input/output jacks.
3) Establish an electronic mailing list to all site technical coordinators and test with each one singly prior to the event. In configuring CU-SeeMe, use 100/ms for audio bandwidth, with Delta 16k audio compression.
4) Have local folks sit in rows, with a single (or two) chairs in front for featured users. Train the camera with their faces in foreground, the rest of the participants in background, and such that they appear to be looking into the camera when they are looking at the overhead display of the other participants.
5) If you want to begin with a presentation, videotape it and mail the videotapes out, with instructions that they be viewed prior.
6) Establish a moderator, and have participants at each location type their names on their CUSeeMe windows when they wish to be called on by the moderator. The moderator can then see who wants to question/comment and call on them in order.
7) Start with a roll call.
8) If folks are taking turns presenting, maximize their windows when they speak to focus the participant's attention on the right window.
9) When you want to present something in depth and video signal is important, raise the refresh rate and maximum bandwidth to maximum on the presenter's setup, and tell everybody else to turn off their audio and video sends.
10) When the conference is done, have everybody pose and take screen shots of each other!

THE TWO CONFERENCE CALL ROUNDS

As previously mentioned, telephone conferencing between large numbers of people is deceptively difficult. (After all, we use phones all the time!) Unlike videoconferencing, where participants can use body language to cue readiness to speak or respond, conference call turn-taking is largely a function of formal arrangements or quickness to fill a pause, moderated by an effective facilitator. Reviews of the teleconferences were also mixed. Some participants loved them, and wanted more:

"Teleconferencing was too short. I would have liked to have spent more time speaking with the others and felt rushed. Follow-up in the BBS/email was helpful though."

-Alice Hom, NYC

"Teleconferencing provided immediate support for our needs. The process was well organized and NTPIers were very helpful and supportive."

-Gretchen Portwood, Fairfax County

The two rounds of conference calls planned for NPTI were used to get all the site teams on the same page, help them through snags, and obtain project-wide feedback and direction fast. Participants were also given an opportunity to share, briefly, the stages of their policy research. Though many appreciated the potential value of these conference calls, a number found the facilitation of so many people and topics overwhelming and inefficient for their own research purposes. They suggested that conference calls be grouped by topic, so that only those who shared an interest would be part of the conversation:

> "While it was interesting to hear the spectrum of topics by having to teleconference groups made up of a mix of themes, it also limited its practical value. I would have loved, for example, to have exchanged ideas with others doing research on teacher induction and mentoring related issues. The discussion could then have been much more intense and probably valuable for feedback."
>
> -Tina Yalen, Fairfax County, VA

> "As much as I enjoyed talking to everyone on the conference calls, I did not find them particularly helpful to my research. I felt they were helpful as far as connecting the group, but not really very important with specific project needs."
>
> -Kristi Thomas, Fairfax County, VA

> "Perhaps pairing up [site team] groups rather than [project-wide] conference calls..logistically I know it's more of a challenge..."
>
> -Ronald Klemp, Los Angeles

In fact, NTPI staff had considered hosting affinity-group conference calls instead of the second round of projectwide sessions, but decided against it because of the difficulty of scheduling calls. Indeed simply scheduling so that all Fellows could participate in at least one of a series of calls was described as "a monthlong nightmare" by project coordinator Sanda Balaban.

On the other hand, a greater effort to group and emphasize planning by each affinity group could have made a significant difference. Once a majority of members had chosen topics for their threads on the BBS, these could have been preliminarily grouped, and web pages created which linked the profiles of Fellows within each group, provided online support readings and resources for their topics, and encouraged cross-site planning of telephone and videoconferences. While each site, through monthly meetings, provided needed feedback and personal contact to keep individuals on track, the emphasis of topic-based affinity groupings might have improved the quality of content feedback they received.

EFFICIENCY OF THE TECHNOLOGIES FOR COLLABORATION

As mentioned above, a number of NTPI Fellows saw the potential of conference calls for their own collaboration, although survey responses indicated they did not find them useful when project-wide in focus. It is difficult to gauge the usefulness of the various media in assisting the policy work of NTPI, because a lack of response or shallowness of engagement can either be the result of the medium or of the topic or of the interests and expertise of the particular group in the policy question under consideration.

Nevertheless, it was important to reflect on this question. Participants were asked to rate (from 1 to 6, 1 being most useful) the various technologies used in NTPI. In the graphs below, the averages of those ratings indicate an overall preference. From those averages which have significant differences, it is clear that the Fellows found email very useful for their work, and videoconferencing not useful at all. The following graphs indicate how useful Fellows considered the various technologies employed by NTPI to be for their policy work:
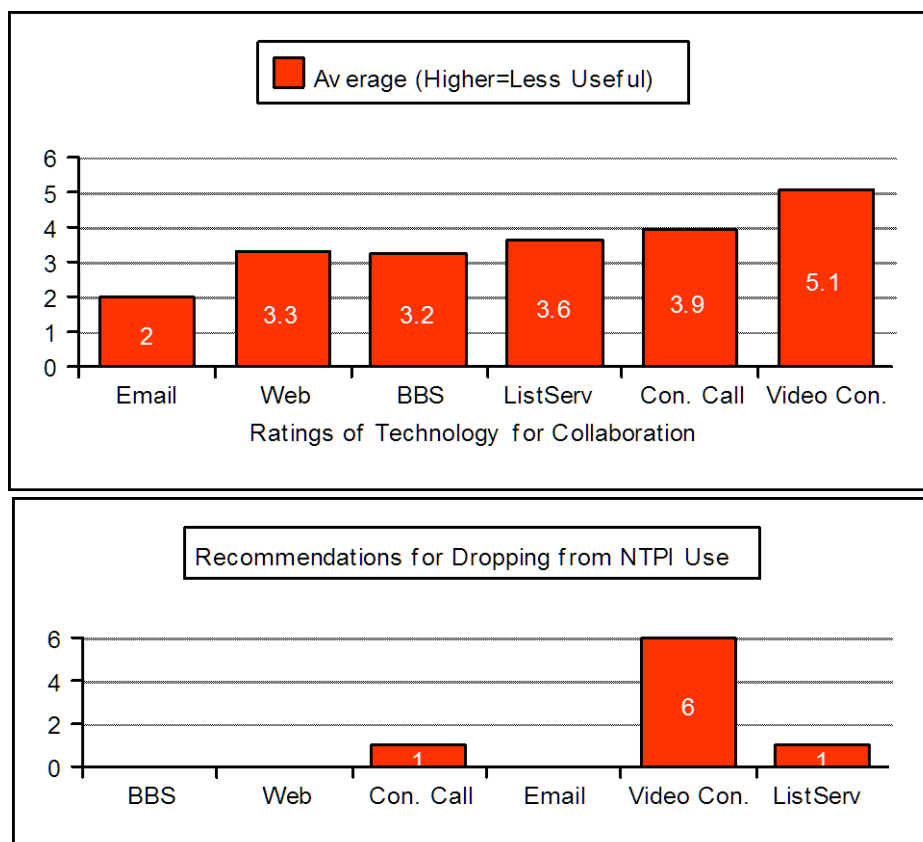
TIME EFFICIENCY RATINGS

In IMPACT II's New York City Teacher Policy Institute (the model for NTPI), teachers developed a number of "kits" which were intended to provide colleagues and policymakers with essential tools and strategies to improve the quality of teaching and learning. One of these kits examined Time Management, and referenced a number of recent studies and papers on the role of time pressure in limiting the scope and degree of educational reform. Located on the web at

<http://www.teachnet.org/tpi/timekit>, this online essay by Julian Cohen and Benna Golubtchik described the primary yardstick against which NTPI's technologies would be measured in practice—the time it took to learn, access, and use them effectively.

> "Time is always a factor - for training, for practice, to learn about up to date software and strategies to effectively use computers in the classroom. It's a precious commodity which we don't have much of in school these days. That's why the e-mail, listserv, and BBS which we've been using have been very important in our work."
>
> -Alice Hom, NYC

> "Email was the fastest, easiest way to get on when there is little time available. I am emailing frequently, and improving technology skills from these experiences."
>
> -Diana Takenaga-Taga, Los Angeles

What kind of thinking goes in to determining the power of a given tool to do a given task? Someone once came up with this equation:

$$Power = Work/Time$$

In other words, the less time it takes to do a given amount of work, the more powerful the tool. Teachers, as everyone now knows from a host of research studies if not firsthand experience, are short of time. If they are going to take on the role of policymaking, they will need to gain the most leverage possible from their collaboration in order to produce quality work. It is this fact that makes a project like NTPI (and evaluation of its use of technology) of particular importance to the national effort to reform public education.

Below, NTPI Fellows rate the communication tools for time efficiency:
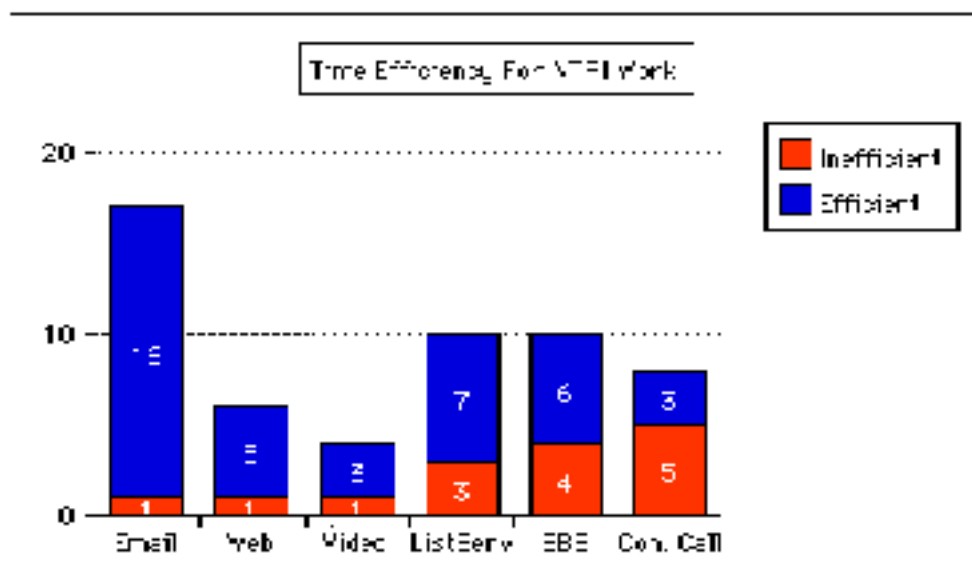
In reading this graph, consider the ratio of responses for any given technology. Responses are most ambiguous when the ratio of votes for inefficiency (in red) to votes for efficiency (in blue)

approaches 1:1, as is nearly the case for the Bulletin Board. Both Email and the Web, in contrast, are largely considered efficient, with ratios of 16:1 and 5:1, respectively. These ratings were backed up in the comments on usefulness: for many NTPI Fellows, this project was their first encounter with the Web, and for others, the first opportunity to work in such a focused way with an online research community.

THE FELLOWS DISCOVER THE WEB

By matching a community with a focus and an enabling array of tools, NTPI demonstrated convincingly the power of electronic networks to support and empower human ones:

> "I try to keep myself informed about what's going on in education, particularly with regards to reform, policy making, grant writing, and professional development. As I network with other teachers [through NTPI], I'm finding out more about educational groups and organizations which can help my school and me in my a variety of ways. I'm able to do more on-line research and this has been convenient."
>
> -Alice Hom, NYC

> "[I found email efficient] because the issue being pursued was focused and specific and directed at the one source who could actually be helpful. When I need info, for example, to track down a potential source in NYC, an e-mail to Ellen/Sanda brought me results! "
>
> -Tina Yalen, Fairfax County

Although many participants growled at being nagged onto the Net, discovering and developing the capacity to find and share information via email and the web was a striking experience for many. While all the Fellows quoted below are saying similar things, reading all these accounts conveys the "IMPACT" of the NTPI experience on the professional development of the participants:

> "[With the Web] I was able to access a variety of resources related to my topic (and many others) easily and quickly. This saved me so much time-few library visits. Email made communication so fast and to the point and not time-dependent.... I access resources for my classroom, schoolwide/district-wide activities, university classes, curriculum, personal inquiry. Before, I mostly just used email. Through being "forced" to use technology for this project I have become comfortable and adept with it so that it has now become an invaluable, indispensable tool for my classroom and outside educational projects. "
>
> -Jean Becker, Chicago

> "I feel I have access to a greater variety of resources. I still like personal conversations better and I feel I get more out of them when working on a project. However, I was surprised at how well I've adapted to communicating through electronic means."
>
> -Judi Fenton, NYC

> "This process has reinforced the importance of learning through a real world application of knowledge. I am using the WWW, email, and listservs more often as I have gained a new appreciation for the role and value of technology as a research tool. I am more comfortable helping my students access information from the WWW for research and debates, I use email more often to communicate with parents, other teachers, students and contacts that have been a good resource for my paper, and I have enjoyed reading various listservs that relate to educational issues. "
>
> -Carol Horn, Fairfax County

"I like the instant feedback. The web gives me security and the BBS is an anchor. I am in such a better place today [than when I began the project]. I am teaching other teachers and my students and my confidence has soared. ... I am accessing info for my project, but also applying skills to my classroom teaching. We are making connections with the community and new critical friends."

-Margaret Hoyt, Boston

"I'm getting more used to using the web...when we began this project I was still a neophyte with it, but the project has gotten me more familiar with the web...I'm still learning, but at least I'm hitting a stride."

-Ronald Klemp, Los Angeles

"I feel very comfortable using search engines for various topics. When I first started using the web, I was very cautious about joining listservs. NTPI has helped me identify excellent listservs that have helped me develop as teacher learner and teacher researcher. I am using the [NTPI] Digital Library [<http://www.teachnet.org/ntpi/library>] as a model in my work with teachers and administrators in my online project with the Milken Foundation."

-Peggy Wyns-Madison, NYC

"I have learned to access national sites to find out the latest news on education issues. I now do nearly all my research on the Internet. I can't believe that I didn't really know that I could access ERIC on my own computer!"

-Gretchen Portwood, Fairfax County

"I had never been on the Internet before this project - it has blown my world open! I have learned the extensive power of research on the web, as well as the opportunities for communication that are instant and simple. I am much more aware of relevant issues and information in teaching and other areas as a result of the immediate and vast amount of information I can access from my home. I spend time on the Internet daily, and can hardly imagine my professional & personal world without it."

-Kristi Thomas, Fairfax County

"I hesitate to get on the WEB because I lose hours as I read and search - BUT IT IS FUN! I have some what conquered this animal, so I feel empowered to share with others. I download or clip information and share it with teacher who might use it in some way. I have changed my view on staff development as a result of this ...[SD] is not just attending meetings, it [comprises] the daily sharing and supporting each other as we learn new things teachers can do to help each other become informed and helpful to their students."

-Lynda Williams, Santa Barbara County

GOOD LISTSERV, BAD LISTSERV

During the summer, a communications table was prepared to introduce NTPI communication technologies, containing the following information to guide the Fellows in making the most efficient and appropriate use of each:

Email
Mode: Person to Person
Purpose: Individual Conversation
Tips: Think about moving conversation to the BBS when policy discussion becomes appropriate for the group.

Listserv
Mode: Unmoderated Person to Group
Purpose: Project Announcements and Administration
Tips: Be sensitive to overloading this - it dumps messages in all mailboxes, so posted messages should be important to everyone or time-dependent.

Bulletin Board (BBS)
Mode: Moderated Group to Group
Purpose: Policy Discussion organized by topic, asynchronous (post anytime!).
Tips: Use of the BBS will form the record of NTPI discourse and process. Ill-formed postings may be edited, removed or redirected by the moderator. Collaboration on project-wide documents will take place here, as well as sidebar discussion threads.

Videoconference
Mode: Real-time Audio/Video Conferencing
Purpose: For projectwide meetings, enabling face to face contact and document sharing, and Internet training sessions.
Tips: Because of the challenge in coordinating and configuring systems, Internet Videoconferencing is usually viewed as a special event. However, if you and your target person have machines that can stay configured and fast Internet connections (T-1 or better), it beats the telephone for productivity and depth of communication, allowing for body language and facial expressions to add context.

Website: Member Profiles and Position Papers
Mode: Person to World
Purpose: Personal Home Pages for NTPI members
Tips: Intended to help us get to know each other, these pages can be linked to favorite websites and resources, and modified at any time. The index page is a convenient point from which to email any NTPI member - keep it handy.

Of all the technologies used in NTPI, none inspired the degree of enthusiasm and horror of "NTPI-l", the project listserv. Most of the complaints came from unintended uses of this medium by Fellows—but so did the inspiration it kindled. The broadcast power of the listserv had been unknown to many before this project, and they found the prospect exciting:

> "The listserv proved an immediate way to pass information of note to everyone, immediately. This was my first experience with a listserv, and I thought it was a powerful tool in bringing us together. I have Netscape, and was particularly helped by the links sent to us through the listserv, as well as placed on the website. I did not have a problem with the amount of messages on the listserv—I thought the constant info helped to keep me connected and enthused."
>
> -Kristi Thomas, Fairfax County

> "Email kept me plenty busy, there was so much coming that was not necessary. But one typing of a message and it could reach all NTPI fellows and those who wished could respond. I was able to keep up on activities without having to go to BBS where there was little activity."
>
> -Lynda Williams, Santa Barbara County

> "I felt that the listserv was under-used, especially at the beginning of the Institute. It could have been used to bring our attention to new items on the website, areas of interest

to all in our individual project topics, and brief comments on readings. I think that we could have had some interesting, and more interactive than the BBS, conversations on the listserv."

-Judi Fenton, NYC

Judi is correct—more liberal use of the listserv would have encouraged participation and discussion...for some! While not everyone reads the BBS, almost everyone reads their email regularly—a tempting opportunity when you want feedback fast. However, most listservs exist specifically to discuss a given research topic, and users subscribe and unsubscribe as their interest in reading the postings waxes and wanes. For NTPI, on the other hand, everyone needed to subscribe for the sake of project administration—and the multiplicity of topics (35!) made such a use by individuals impractical, if not maddening, depending on one's tolerance for unwanted mail.

The range of responses to the usage of the listserv varied significantly, and many fellows found it to be more of an annoyance than a significant source of support:

> "Sometimes there was relevant, useful "stuff" on the listserv, but so often there was mountains (figuratively) of unnecessary responses and email-type notes that took a lot of time to wade through."
>
> -Jean Becker, Chicago

> "[It was inefficient] getting email that was not directed to me."
>
> -Berta Berriz, Boston

> "I became a little impatient with how people were using the listserv. It had too much stuff on it that didn't relate."
>
> -Peter Dillon, NYC

> "The listserv clutter sorted itself out, but was not always purposeful. The listserv is a great idea, but needs explanation for its use at the start, I guess in more understandable terms."
>
> -Margaret Hoyt, Boston

> "My only issue with the listserv is that it creates a lot of mail that isn't intended for everyone."
>
> -Ronald Klemp, Los Angeles

> "The listserv was probably absolutely efficient for you in NY to disseminate information to all of us, I found myself increasingly frustrated with having to read many messages that, frankly, I did not need to read!"
>
> -Tina Yalen, Fairfax County

GOOD BBS, BAD BBS

The other half of the argument for the listserv was frustration with the Bulletin Board. In theory, the concept of considered, moderated, focused asynchronous discussion organized by topic was grasped and embraced by many. The potential value of the BBS to remote collaboration was not hard to imagine:

"The BBS had value in the power of public exchange of ideas. Teachers can be accountable to one another when their ideas are developed in an open conversation about teaching/learning. This accountability can have a stronger effect on decision and policy making."

-Berta Berriz, Boston

"When the technology arrives at my school; announcements, conversations, etc. will take place on a bulletin board. "

-Gwen Clinkscales, NYC

However, in practice the BBS did not live up to its promise for many Fellows. As mentioned above, the design and functionality of the "Allaire Forms" application hosted by NTPI's internet provider, SohoNet, was inadequate at the start of the project, and a process of troubleshooting and design modification left many teachers cold. It was not always clear whether a difficulty was their fault (which they assumed, given their inexperience with the technology) or a problem with the server or interface. In the latter case, users might give up after hours of frustration, only to be informed by the listserv the following day that their time had been wasted. The current state of the BBS interface is one which supports the kind of work needed, but perhaps came too late for those with finite patience. One lesson learned here could be "don't cut cost corners on primary interfaces or beta-test with new users."

In addition to frustrations with an initially clunky interface, some Fellows had Internet connections through AOL (the villain of choice whenever problems arose, as mentioned above) that mysteriously devoured the long postings that had been laboriously constructed to make the best possible entrance into the cyber-symposium:

"The threads in theory are an excellent way for teachers to interact with each other. But sometimes it seems that technology is wonderful until you need it, and then there is always some problem such as the server is down, etc. etc. etc. ...The only drawback to the technology aspect of the NTPI was finding the time to actually log on the BBS, read all the postings, respond to them, and then be "unable to connect to the server" and lose everything you had written. Yes, I know you should log on, download everything, then respond and upload, but that takes even more time. It becomes very frustrating."

-Gretchen Portwood, Fairfax County

"[The BBS] was a lot more time consuming than Email or the Listserv. I printed other fellows' threads, and then thought about them and composed responses off-line, and then returned online and posted them. This did take a lot of time and sometimes too much.."

-Carol Horn, Fairfax County

"I didn't use [the BBS]. The time crunch made this the first thing to go."

-Sheri Scott, Santa Barbara County

"The difficulties other NTPI fellows seemed to have with the technology hurt the success of the BBS in my opinion. Their frustrations and personal technology issues resulted in stunted input on the BBS."

-Kristi Thomas, Fairfax County

"In the beginning I could not even find my own listing. Bram's changed format is a fantastic time saver for getting to the BBS. But this format is terrible. When a message comes this way it is hard to read one message and to print it out is impossible. This questionnaire took from 10pm to 1:30 am on Friday and from 9:20 PM to 11:48 PM so far tonight. The page 3 did not work so I have to try another way. I want to get it out of my hair. 6 hours of a weekend is expecting too much as is this whole project. Mentors in California get $5000 and spend 1/12 the time as this is demanding. I was going to get my survey redone this weekend—forget that."

-Lynda Williams, Santa Barbara County

A painful footnote to these AOL frustrations associated with using forms-based data submission (through the BBS and for this survey) was Sohonet's recent choice of an Internet filtration strategy (geared to keep spammers—unsolicited advertisers—off the listserv) which resulted in blocking or delaying any mail originating from AOL for a week or so. In fairness to Steve Case, therefore, the scapegoating of AOL may have been occasionally misplaced.

DISAPPOINTING RESPONSE LEVELS

But the most discouraging aspect of the BBS for many was logging on and finding that after all this time, still no one had responded to one's thread, or replied to the cogent response one had made to another's. This was all the more frustrating when one imagined how useful the BBS could have been:

"I'm not sure that [the BBS] significantly [helped]. I felt the potential for contributions to my work was vast and I am disappointed that I did not get the kind of feedback that I wanted. I tried to give that very kind of feedback and encouragement to my fellow NTPIers and I tried to ask for what I wanted. Maybe I wasn't asking the right thought-provoking questions or maybe none of us are as comfortable as we should be with the technology."

-Judi Fenton, NYC

"The BBS never quite lived up to its potential, though it started out well. I realize that many (or most) of us were not "critical friends" the way it was intended, but it just took too long to get through threads, read listserv, email and do the individual research....I received very little feedback on my thread so all I can say here is that it gave me assurance that I was heading in the right direction. Most of my feedback came from my local group."

-Jean Becker, Chicago

"Mostly the feedback has been generally supportive in that at different times it encouraged me to keep developing my thinking. I didn't receive much specific feedback that addressed particular points I was working on. I don't think our affinity groups ever got going in a strong way. I take responsibility for that, though I think we might have

tried to develop a general framework early on that would bring people more formally together."

-Peter Dillon, NYC

"I like the instant feedback. The web gives me security and the BBS is an anchor. It gave me confidence at the start, but I did not develop a dialogue with others. Maybe my topic is not interesting to others. I would have liked getting responses to my survey."

-Margaret Hoyt, Boston

Not everyone checked the Bulletin Board frequently enough to give support or respond quickly when support was received, which contributed to the lack of available feedback. Teachers lack time, and connecting to the Web is not always easy (particularly with America Online). However, as the graph below shows, the vast majority of respondents did not check their threads more than once a week, and this must have had an impact on how often they were moved to respond to threads, write back to those who had responded to them, or explore new threads.
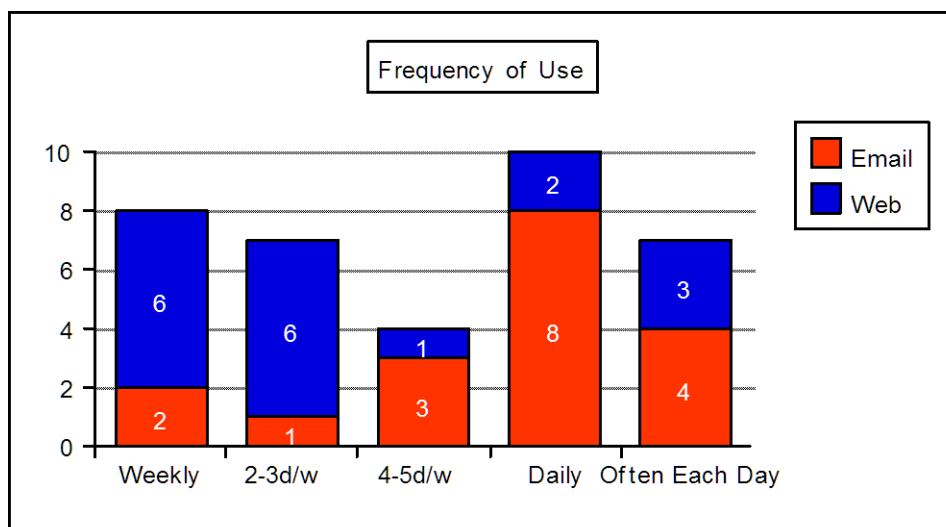
Email, on the other hand, was generally checked daily which, for this population, was an argument in favor of using multiple listservs, rather than a bulletin board, for policy debate. It was suggested at one point that policy topics be grouped to encourage the development of mini-communities within NTPI, and this was tried with a new interface to the Bulletin Board. What was not tried—the creation of separate listservs for each of these groups—might well have made a great difference in the quality and frequency of feedback received. The number of topics (35) was probably overwhelming as a field to enter and respond to narrowing the field through separate listservs might have solved that problem:

"I found it difficult to review all of the research topics on the BBS because of the number of topics. All of the topics were interesting, but I did not have a response for each person. Yet I wanted all of the members to know that I saw the value of their research, but did not have any additional information for them to include in their research."

-Peggy Wyns-Madison, NYC

If web-based archives were automatically created to make all affinity-group lists available for others who wished to join in and give comment (such as the NTPI expert mentors Lieberman and Wagstaff), it's difficult to see why this strategy would not have been more stimulating to discourse within threads than relying on a bulletin board alone. The need for separate subscriptions in order to participate, however, would have effectively isolated the "affinity groups" from each other, perhaps masking connections that might otherwise be made:

> "I didn't receive a tremendous amount of feedback, so there was not a whole lot of change...I did receive some validation of what we are doing, however and that is good. I think that there are always critical issues that pop up which may not include everyone's thread, which is okay too...[The BBS] is a good balanced way of looking at the overall project and provides a good source to continue conversations."
>
> -Ronald Klemp, Los Angeles

As another solution to the poor feedback problem, Judi suggested that thread managers be notified via email whenever their thread was responded to. As the BBS was initially configured, the choice belonged to the person posting whether to send an email copy to the thread manager or not. If this BBS is to be used for future projects, this change would definitely help.

RATING THE BBS FOR CONTENT

This summative evaluation can provide only hindsight and recommendations for future projects. As the chart below indicates, most NTPI Fellows considered the BBS to be of little value to them in their research (though, in fairness to averages, the mean falls within "Some Value" rather than "Little"):
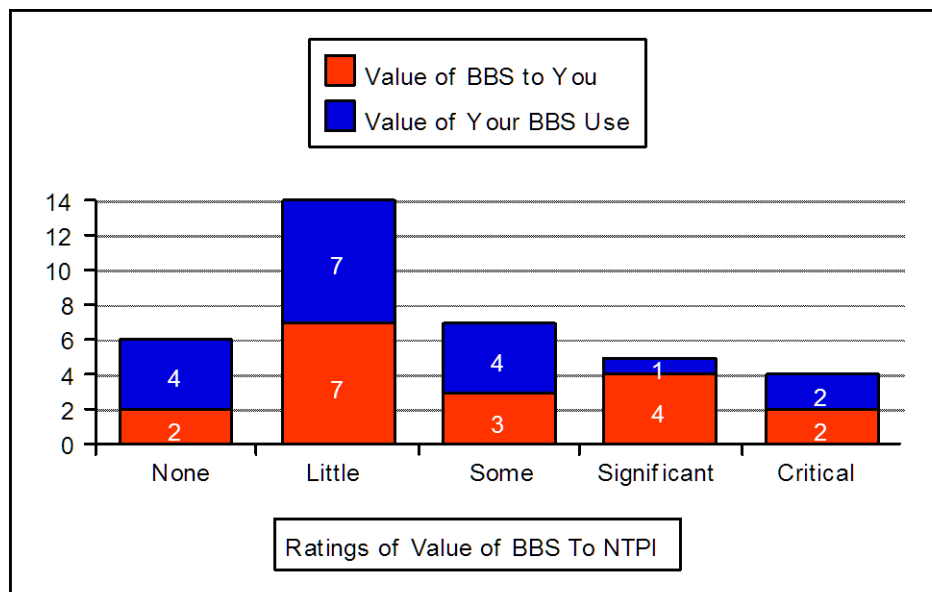
In discussing the role and value of the BBS to the goals of NTPI, respondents considered both the quality of the medium itself, and the degree of interest and expertise that the rest of their community brought to their topics. The occasional visits to the BBS by mentors Ann Lieberman and Lonnie Wagstaff provided great levels of rejuvenation and reflection to all, as they were careful to have something to say to everyone. These responses got stagnant threads moving again. In addition, many postings directed Fellows to online resources which, while not leading to further BBS activity, were of great help to them in drafting their position papers:

> "I received several very specific leads for contacts regarding Beginning Teacher Induction on the BBS. Those contacts certainly helped me to gain information on my topic. I was particularly impressed and empowered by the input I received from Ann Lieberman and Lonnie Wagstaff. As professionals immersed in this type of research, their comments were very important and particularly helpful. Most of the input I received was specific contact info - not much philosophical talk. ... Perhaps it would be worth having more of that interaction with experts in the field, and less emphasis on our personal input. I know it wasn't easy for [NTPI] to provide the input from "pros," but perhaps it would be worth considering having one a month respond to our threads--people like Linda Darling-Hammond, John Saphier, John Goodlad, etc. I think their involvement in name and deed might also strengthen the clout of the final paper."
>
> -Kristi Thomas, Fairfax County

"The feedback that I received on the BBS was helpful in showing other facets that I had not contemplated. I had assumed that policy writers were knowledgeable and a policy came in as law. Some feedback has let me know that I need to focus on a single concept. I cannot change the world, but maybe I can get others to look at the real world to see if their policy achieved the expected goal or if they need to rethink the problem."

-Lynda Williams, Santa Barbara County

On the other hand, the presence of "expert voices" could be construed as disempowering. NTPI Fellows comparing themselves and their research base to the likes of Ann Lieberman might well question the value their own comments had for each other:

"The feedback on my mid-term has been limited because I did not respond right after the comments were placed on the BBS. I did not have the time, background, or confidence to expose my lack of knowledge. Words do not come easily on these subjects: I don't talk the talk nor do I know the field. ... I find my responses would be close to the comments sent by others, or I do not have the time to write comments....I did not feel qualified to add much to others projects. I feel that feeling changing as I dig deeper in the research and readings. The BBS did not produce a "give and take" or building of information because I was not ready with any information or questions. Too much was too new and I was searching for questions in the wilderness."

-Lynda Williams, Santa Barbara County

In another example, "discouraging words" from "the experts," recommending the abandonment of a topic, resulted in a Fellow turning to her own local site and other sources of information for support, which she then found, proving that Fellows themselves are often the "inside experts":

"[Although] the BBS was well organized and kept up-to-date quite well [and was a] very helpful way to keep "on top of" new developments, I personally, have had minimal responses to my thread on the BBS and this has been disappointing. Except for welcome encouragement from Sanda and Ellen and excellent detective work on my behalf by them, I have had very little constructive help. Feedback I received from the BBS thread had little effect on my midterm or current thinking. In fact, both Lonnie Wagstaff and Ann Lieberman both basically saw my topic as too narrow or somehow off the mark. My research has, however, shown me that it is worth the pursuit. My topic, apparently, did not generate much of a response, so I came to rely more on my local NTPI fellows and my own relentless pursuit of information and sources."

-Tina Yalen, Fairfax County

Aside from the occasional infusion of expert advice (which was generally appreciated but not always), there was a wide range of activity the rest of the time--some threads received a lot of attention, others little or none. Was it the topic itself? The way it was introduced? The expertise of the other Fellows? The difficulty of navigating the site? The stress of posting replies? As the variation of the responses above indicated, the secret to getting an online party going was hard to pinpoint. However, for at least one NTPI Fellow at each site, the BBS proved significantly or critically valuable to their work. Applying the lessons learned above, it should be possible to design a remote collaboration educational policy analysis institute with much higher levels of activity and satisfaction.

"I am very pleased to see that so many teachers are professional educators. It is inspiring to know that so many of us see our work as important and far reaching— effecting the future. Teacher leadership grows tremendously when we take these kinds of positions. Having the perspective of others helps one to better focus or see things in a better/difference light. I feel that I have seen some aspects of our profession in a different light as a result of some of the feedback that I have received / reviewed on the BBS threads."

<div style="text-align: right">-Francine Johnson, Chicago</div>

"From the responses, I learned of new literature sources which helped to direct my thinking e.g.. Dr. Wagstaff led me to read Sergiovanni's work and it was encouraging to learn about and read the work of someone whose ideas are in alignment with my own thinking as it has been developing. The feedback I received from Dr. Lieberman was also extremely helpful as she told me of research which directly related to a topic I was focusing on - Shared Decision Making. After reading the research and learning that in and of itself, SDM does not ensure better decisions, I decided to change my topic and focus more on teachers as professionals/leaders. I began to realize that, when teachers are perceived and treated as professionals, then shared governance is not an issue but a natural outcome. I now see SDM as an important component of a needed change in the perception and treatment of teachers. Sanda and Bram also provided many valuable sources of information which I used extensively. The electronic library is excellent."

<div style="text-align: right">-Carol Horn, Fairfax County</div>

"The feedback made me focus and get the task done. It helped me refine my questions and clarify the work."

<div style="text-align: right">-Diana Takenaga-Taga, Los Angeles</div>

"The threads really enabled me to get feedback from people re: my topic. The various components on the BBS were helpful so that I could get to know what other people were interested in to see what was happening at teachnet.org.... People have shared their viewpoints and validated some of my own ideas about the use of teacher portfolios in professional development. I've been able to correspond with people from different states to see what is happening and how they see the use of portfolios in the near future. The BBS has helped me to really communicate with teachers knowledgeable about the subject and willing to provide critical feedback in helping me to focus my area of study."

<div style="text-align: right">-Alice Hom, NYC</div>

"I felt validated and that I was on track. I also felt the feedback helped bring my position into better focus and to convince me of how widespread the need is for policy in my area of concern."

<div style="text-align: right">-Jerry Swanitz, Santa Barbara County</div>

APPENDIX A: Favorite Online Sources

The following two lists—Favorite Listservs and Favorite Websites—list each selected site only once. These lists do not, therefore, indicate degrees of popularity. For example, many respondents listed Teachnet and ERIC as favorite websites, but they are listed once.

Favorite ListServs
(In order to make these listservs available to all interested fellows, if you submitted one of the listservs below, please email the subscription information to <impactii@aol.com> and we will add it to this report on the BBS.)

Author Online —Jean Becker, Chicago
NYTimes-D —Peter Dillon, NYC
Ed-gov, teachnet —Judi Fenton, NYC
Edinfo —Alice Hom, NYC
USA, EdNet Briefs, Edinfo, WMCURRIC, XTARD —Carol Horn, Fairfax County
Block scheduling, Title I —Margaret Hoyt, Boston
Info.clasiv.con, mckenzie@fromnowon.org —Peggy Wyns-Madison, NYC
Department of Education —Gretchen Portwood, Fairfax County

Favorite Websites
(In order to make these websites accessible to all interested fellows, if you submitted one of the websites below and know its URL, please email it to <impactii@aol.com> and we will add it to this report on the BBS.)

NCREST, National Staff Dev. Council, NCREL, ERIC, NFIE, NEA, AFT, ILL. State Board of Ed, Natl Geographic, AIMS ED., Zia Ed. — Jean Becker, Chicago

NY Times, OGradys Power Page, Columbia, NYPL —Peter Dillon, NYC

Lifelong.com , Aero.com —Judi Fenton, NYC

AskERIC, teachnet —Alice Hom, NYC

ArtsEdNet, Exploratorium, Smithsonian, Megacrawler —Carol Horn, Fairfax County

Block Scheduling —Margaret Hoyt, Boston

Luther Vandross, Ticket Master —Francine Johnson, Chicago

EDWeek, Pathways to School Improvement, New Chalk —Peggy Wyns-Madison, NYC

All the education/school reform sites on NTPI —Gretchen Portwood, Fairfax County

Webquest, any textbook publisher, Reading recovery, LA Times, Children's Literature Web, American Library Assoc. —Linda Wiezorek, Santa Barbara County

Infoseek:SmartInfo, ERIC, Washington Post —Lynda Williams, Santa Barbara County

APPENDIX B: Other Graphs of NTPI Technology Use

Operating Systems

| none | mac | w31 | w95 | w31/mac | w95/mac |

Home OS   Work OS

Connectivity Method

| NONE | DIALUP | 56KB | T1 |

At Home   At School

Email Use Frequency Before NTPI

| weekly | 2-3d/w | 3-5d/w | daily | often each day |

before NTPI

After NTPI

after NTPI