

# Barnard College

## Three-Year Technology Plan

April 17, 2001

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### Background

Based on the remarkable results of the College's first technology plan, Barnard can now boast of significant accomplishments in enhancing technology on its campus. We have clearly made the College competitive in its access to state-of-the-art technology on the desktop and the Internet. We have accomplished this with careful investment of resources and by maximizing the use of technologies in areas where they have had the greatest impact. We have also formed a solid computer infrastructure on which to grow. Barnard's network is now fast and stable, forming a backbone that connects the entire campus to a wide range of computers. We have taken advantage of web technology<sup>1</sup> and email applications to bring those on campus closer together and improve our connections to the world through the World Wide Web. Virtually all full-time faculty and staff have access to state-of-the-art computers and software, and our students no longer face limitations in getting access to technology: they can reach these resources from an expanded number of labs on campus, their individual dorm rooms, and classrooms equipped with networked computers.

Many of Barnard's academic departments, such as Psychology, Math, Economics, and Environmental Science, to name a few, were early adopters of new information technologies and have made inroads in the use of computer technology in the curriculum and continue to innovate as the technology advances. The Barnard Electronic Archive and Teaching Laboratory (BEATL) has also promoted the use of web technology and has already mounted several successful humanities and social sciences courses that have one or more technology components. On Barnard's administrative side, we have stabilized the software applications that support our administrative processes on more sophisticated computers, and simplified access to important College data through the use of web technology. Students and faculty advisors can access degree audit and registration information and students can look at their transcripts and routinely access the status of their bills on the web. Faculty and staff no longer have to rely on hard-copy budget reports and can simply go to the web for a current departmental expense statement. In short, we are rapidly expanding the use of technology in the classroom and in offices.

As we look ahead, we realize that five years is perhaps too long a horizon for a technology plan. Technology changes quickly, so a three-year plan makes sense. Where Barnard's original plan focused primarily on enhancing the infrastructure supporting our campus systems and applications, this plan focuses mainly on the programmatic aspects of our use of technology in the classrooms, streamlining College administrative applications, and providing

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<sup>1</sup> Web technology emerged in the mid 90s as a means for accessing information over the Internet. At Barnard, we have developed ways to integrate data from a range of computers so that it is accessible from a web browser. The process greatly simplifies training on new programs, since access to information can be provided through a common source, rather than having to learn several software programs in order to get access to the data. We see the web as the primary means for the Barnard community to access information stored in computers.

greater access for all College constituencies from prospective students to alumnae to information through the web.

## **Creating a supporting infrastructure to reach our goals**

The plan draws from the goals established last spring in the College's progress report on technology. These goals have been incorporated as major underpinnings of the College's strategic plan and are summarized below, along with the recommended courses of action needed to achieve each of them.

- *Ensure that all students graduate with multiple computer competencies, acquiring computer skills that are a natural extension of Barnard's curriculum and are supplemented with specific training and work opportunities outside of the classroom.*

These competencies should prepare students with the necessary computer skills to succeed in whatever path they choose. Acquired computer skills should be a natural extension of Barnard's curriculum with training that extends students' learning beyond the simple basics of software programs and introduces them to real life uses of computer applications. Students should also have access to a wide range of information available through computer web-browsers to the classroom, the library, administrative offices, and the outside world.

Additional student workers will be needed to provide campus support in all computer-related areas: consultants, help-desk, media services, web support, and residential computing. We will look for better ways of recruiting students, by creating student-training sessions during the summer and just before the terms begin, and by instituting a student summer intern program to promote work opportunities in computer-related areas. We have already begun a limited summer intern program, though in order to attract the best students and expand the program we will need to find better paid incentives. Not only will students benefit from these programs, but the College will as well, since students are an important supplement to Barnard's limited computer staff and provide much needed assistance and support across all aspects of computing.

### Recommended actions:

- Expand the College's employment opportunities for skilled student workers in the areas of Resident Computing Assistant (RCA), help-desk and user support consulting, networking and systems assistants, and "websters." Provide experiential learning opportunities in technological areas, and develop classes, seminars, and training programs to allow students to acquire and apply technology skills. Work with the Office of Career Development to assist our most skilled students in finding career opportunities after graduation.

- Expand tutorial programs and classes for all students to include hands-on experience with the most widely used spreadsheet, word processing, database, and web authoring software. Build training programs that include sessions throughout the academic year in a variety of locations, including the residence halls, classrooms, and

computer labs. The College should also acquire computer based training software that can serve as self-tutorials and be accessible through the College's intranet.

- Establish a competitive student travel fund to supplement training opportunities by allowing Barnard's most skilled students to attend off-campus training sessions and technology conferences.

- Provide a variety of computer labs to support different types of student learning opportunities. The addition of physical space for computing is an important element in Barnard's long-term planning for technology, though the College's immediate needs include the following: 1) an additional student resource lab, 2) the implementation of several strategically placed labs incorporated into existing departmental spaces to supplement specialized laboratory instruction, and 3) the development of wireless "laptop labs" that can be set up in the library, campus classrooms, or even possibly the Barnard lawn. The wireless labs consist of 20 – 25 laptop computers that are housed in a portable unit that can be used to provide access to Barnard's computer resources from virtually any place on campus. The portability of these units will promote group-learning opportunities in traditional classrooms and labs, as well as in non-traditional teaching locations.

- Incorporate into Barnard's curriculum the use of technology in the areas of data manipulation, production of web pages, after-class interaction using the web, email or listservs, and the integration of complex digital material such as audio, video, and graphics into classroom teaching and research-related projects.

- Augment the software and equipment that is available to our students in current computer labs to include Frontpage, Dreamweaver, Flash, Photoshop, Fireworks, web authoring tools, scanners and workstations to digitize existing photos, video and film.

- Provide compact traveling carts with laptops, portable scanner and printer to be accessible to students for off-campus research-related projects (at museums, for field work, etc.).

- Explore applications that utilize Personal Digital Assistant (PDA) technology to translate web information to even smaller hand-held devices that could promote simpler wireless access to College data from any place on campus. Looking ahead, it seems more likely that students will rely on these simpler hand-held devices to access key information from the web, rather than carrying lap-top computers on campus, and the College should find ways that it can translate information such as announcements, calendars, events, and key student data to this medium.

- Upgrade the network and power connections in all common spaces such as lounges, the café, and library to provide for additional public access PCs.

- Highly recommend, though not require, students to own a computer. After a long review, the BLAIS committee has decided that students should not be required to own a computer, but recommends that the College continue to make information available to students on purchase programs that it has negotiated with third-party

vendors. Though the numbers of students who bring their own computers to campus is rising, there is still a growing need for public-access labs. The labs provide an important learning and social environment for students.

- Promote the use of web applications for interacting with students. Build on the successes of automating our on-line student systems for advising and program filing by finding other ways to simplify and streamline the administrative burden of students.
- *Build on the record of early faculty adopters of web-based pedagogical applications, so that faculty computer competence extends to the kind of broad-based technological expertise that will allow faculty to enhance their course offerings and move beyond traditional methods of teaching and interacting with their students.*

Faculty computer competence should extend beyond ease of use of email and desktop software to a more broad-based expertise that enables faculty to use new technology to enhance their course offerings and move beyond the traditional methods of delivery. We will need to find ways to spread this knowledge to faculty with the goal of making teaching with technology as common and easy as using photocopied handouts or a slide projector. We will need a variety of training options to meet the more sophisticated needs of the faculty, as well as additional training support and facilities. The College should endeavor to increase access to technology by allowing faculty the time to work with new technologies. Faculty should also be supported in the use of this technology for their research and creative work.

Recommended actions:

- Continue the support of BEATL. The College should maintain the staffing and support of this important program with its own funds as grant funding from the Mellon foundation runs out. As one of the College's most successful programs in stimulating instructional innovation, the College should explore ways of broadening this support to departments outside of the initial focus on American Studies. BEATL should serve as a key research and development component in meeting Barnard's instructional technology goals. BEATL will experiment with newer ways of using technology in the classroom and development of courses that contain a technology component, with an eye to making these courses more "exportable" or adaptable to long-distance learning opportunities. BEATL will work closely with Academic Technologies, the Library, and Administrative Computing, with the latter three providing technical support for instructional systems and software already in place and targeted programmatic initiatives.

- Implement a competitive faculty course development program (Faculty Teaching With Technology Fellows –FTTFs) that allows for faculty release time and stipends for developing courses with a technology component. The program will begin modestly by awarding four faculty members one course off per year for two years<sup>2</sup>. In addition to the course reduction, each professor will be awarded a stipend of \$10,000 to cover miscellaneous development costs, such as software and hardware, plus a \$2,500

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<sup>2</sup> In the second and subsequent years, two new fellows would be selected so that there will always be an overlap of new and continuing participants in the program.

summer stipend and \$5,000 of student assistance (including the academic year and summer). All full-time faculty would be eligible and would be selected by a faculty committee selected by the Provost based on the merits of the proposed project, and high priority will be placed on projects that show potential to significantly enhance a department's core course offerings and can be used by multiple instructors regardless of who is assigned to the course in a given semester. Support for the course development projects and access to technical support services would be provided by BEATL and Academic Technologies.

- Require that all academic departments have an active department web page and course syllabi listed on the web by Academic Year 2001-02. Currently there is a wide range of departmental information that is available on Barnard's web site, with some departments having rich and comprehensive sites and others having virtually nothing posted. Meeting the goal of ensuring that every department has a viable web presence will require significantly higher web support from Academic Technologies and Administrative Computing and development of templates and web tools that can easily be used to mount and update departmental information on the web.

- Renovate one additional smart classroom<sup>3</sup> to provide for multi-media and audio-visual capabilities. Also, provide for three additional audio-visual carts to be used as resources for other classrooms. New funds will also be required to replace aging equipment and implement newer technology in Barnard's existing smart classrooms.

- Bolster desktop support for trouble-shooting faculty hardware and software problems. Based on the early results of Barnard's technology questionnaire, it is clear that additional desktop support is needed. An additional staff member is targeted for the second year of the plan to enhance the College's support.

- *Upgrade the College's computer network to allow for increased bandwidth for audio and video technology, and explore how the use of wireless technology might provide a better, more cost-effective networking infrastructure.*

Barnard's computer network<sup>4</sup> will need to be upgraded to allow for increased use of audio and video technology on the web. The current network is configured to meet our needs for at least three years, though with the proliferation of applications and the increased usage we must constantly upgrade its capacity or risk severely taxing its useful life. Upgrades to the network can be made in stages, and we anticipate that the network backbone and main campus buildings will be the first to be upgraded, and that the residence halls will follow.

The potential of wireless technology suggests that there may be a cost-effective way to provide mobile computing support and access to technology from any place on campus. The application of this technology may reduce the need for creating more

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<sup>3</sup> As part of Barnard's initial technology plan, the College upgraded 10 classrooms with access to the Internet and state-of-the-art projection and audio-visual equipment.

<sup>4</sup> The network refers to the series of wires and fiber-optic cables that are used to connect faculty, students and staff to each other and to computing resources distributed throughout the campus.

traditional computer labs and may provide a less costly alternative to upgrading some of the wiring on campus, particularly in the College's residence halls. It is important to note, however, that though wireless technology will figure importantly in Barnard's future networking plans, it will not in the short-term completely replace the existing wiring that supports Barnard's network backbone. We expect to use wireless technology strategically, as a supplement to the high-speed backbone, to provide needed flexibility to accommodate locations that are difficult to hard-wire.

Recommended actions:

- Begin a three-year upgrade of the floor hubs and network switches in all academic and administrative buildings to provide for 100-megabit network access to each desktop. This will require replacement of the current Cabletron equipment with Cisco equipment. The replaced Cabletron devices will be used for backup for the networking infrastructure supporting the residence halls. Barnard will delay its upgrade of the residence halls until it can more fully assess wireless technology, since it is quite possible that by the time the residence halls will require an upgrade, wireless technology might offer a more cost-effective approach. We will continue to monitor this emerging technology to maximize Barnard's investment in its networking infrastructure.
  - Acquire networking software to manage the performance of the network, and to increase its reliability and efficiency.
  - Develop several pilot programs with wireless technology that will allow faculty, students and staff to access the Internet from offices, common spaces, the library, and classrooms. Barnard has already implemented a wireless connection point to a temporary office space located at Union Theological Seminary. Other pilot programs are planned for the library, and as mentioned above in the student section of the plan, we are currently exploring the development of permanently installed, but instantly available wireless "laptop labs" that can be set up in the library, campus classrooms, or even possibly the Barnard lawn.
  - Provide for the appropriate upgrade needs for Barnard's web and email computers. This will require the acquisition of five new Unix servers (Oracle, 3 email, and 1 web server).
  - Acquire a new server and necessary software to provide for centralized, large-scale backup capabilities for faculty, staff, and students.
- *Develop the web as the primary interface between users and information stored on computers, providing the best opportunity for a Barnard on-line "community" where faculty, students, and staff can gain access to a vast wealth of information that can be tailored to meet individual needs.*

Web browser technology with its ease of use and commonality across all computer platforms, will be used most frequently as the way in which people access other technologies and information. Web-based systems will proliferate on campus and we anticipate that there will be a growing need for support of web page development and

integrating web technology in the curriculum. Barnard currently has limited staffing to meet these needs, and must define a better support plan for these services.

Recommended actions:

- Require all academic departments to post a viable departmental web page and individual course syllabi by the academic term, Spring 2002. An inventory of what departments are currently posting is being conducted, and based on the results of that inventory, Barnard will develop an appropriate support structure in Academic Technologies to ensure that all departments have access to adequate web support and tools for producing web pages. This plan assumes that one additional FTE staff and additional student support (“websters”) will be required to support this goal.

- Develop a secure web Intranet application that gives users direct access to important Barnard information through a personalized, customizable web interface. The application, possibly named eBear or MyBarnard, would provide users access to a wide range of existing web applications and tools. It would be viewed as a web "portal" serving as an umbrella for the advising, on-line registration, course listings, budget reporting and bursar web applications, as well as personal information, listservs, events calendars, and other points of interest. It would allow for a more logical and immediate access to these services and Barnard’s web services would take on a much stronger presence than they have now.

- Ensure that Barnard retains a strong public profile on the web in areas such as Admissions, Development, Alumnae Affairs, and Public Affairs. The web is increasingly becoming the most important tool used by prospective students and off-campus constituents in getting information about the College. Having viable academic and administrative departmental web pages is vital in support of the College’s overall web presence. In particular, the College should develop a robust web site in support of its alumnae, and develop specific web programs that will allow for greater interaction with the alumnae.

- Develop additional web applications that can serve as tools for users, such as on-line training information, links to technical resources, a college-wide calendaring system for setting up meetings, and room reservation systems.

- Redefine support for web development to place more emphasis and accountability in the offices of Administrative Computing Services, Academic Technologies, BEATL, and Public Affairs to provide the necessary support for the goals defined above. BEATL will provide direct faculty support for developing new instructional applications and for exploring new web technology as they relate to courses and the curriculum. Academic Technologies will continue to support departmental web pages and will develop new programs of web support to ensure that all academic departments have the ability to post course syllabi and other departmental support materials in a timely manner. Administrative Computing Services will take a more active role in providing support for administrative departments who want to develop new web applications and in ensuring that the College keeps up to date on new web technologies that promote more efficient College operations and interface with faculty, students and

staff. Public Affairs will continue to serve as a major resource for web development in the areas of graphics and layout designs, and will continue to work closely with departments such as Admissions, Development and Alumnae Affairs, where the web presence has a more public profile and is crucial to the College's overall image.

This plan also recommends the formation of a web steering committee to ensure that the College is meeting the goals defined above. The steering committee will consist of representatives from the four major areas responsible for web support and will include Lucas Held, Jack Chen, Carol Falcione, and Robert McCaughey.

- *Move administrative systems to the web and encourage the use of new technologies so that the College can conduct its business more efficiently.*

The College should encourage the use of new technologies to transform ways in which the College conducts its business affairs, and to replace out-dated, ineffective and inefficient methods and practices.

Recommended actions:

- Recognize and implement new technologies to improve service levels to students and faculty and reduce the work burden on staff. A good example of this is the on-line web registration process that was developed for students. It significantly reduces the amount of time and increases the flexibility for students to register, but also has the added benefit of reducing the administrative overhead required of the Registrar's staff to produce forms and process registrations. Its features also reduce errors due to human failings to remember all the "rules," i.e., credit limits, and prohibitions on class time overlap.<sup>5</sup>

- Explore ways that the College's data on its administrative systems can be made more accessible to faculty and staff. Acquire software to develop an integrated warehouse database to allow administrative users easy access to important college data for reporting. Explore other third-party applications such as "Blackboard" and "Prometheus" as possible ways to enhance our use of administrative data.

- Ensure that the College's Oracle applications and servers are adequate to support the growing E-business and on-line transactions needed in administrative department such as purchasing, accounts receiveables, and human resources.

- Provide for a stable administrative database environment that stays current with new releases of the College's software provider. Also enhance access to Colleague applications through the implementation of connectivity from the database to commonly used desktop applications, and the procurement of graphical interfaces and report writing software that works in conjunction with Colleague.

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<sup>5</sup> On-line registration was not intended to replace Barnard's strong one-on-one advising system, but it has allowed for less bureaucratic student-faculty interaction and promoted a richer discussion of academic needs.

- Define standards for hardware and software that will strengthen our support of user applications. The College will procure an annual site-license with Microsoft to supply its faculty, staff, and students with current versions of word processing, spreadsheet, database and web authoring software. This will help control the costs of desktop support as well as the costs of upgrading to new versions of software<sup>6</sup>. As part of its initial technology plan, the College instituted an annual computer purchase program to ensure that it was providing for necessary computer upgrades for faculty and staff. The College will continue this program.

- *Leverage our considerable intellectual capital through distance learning opportunities appropriate to our character as a residential liberal arts college, reaching external audiences through the use of emerging instructional technologies and establishing strategic alliances with other colleges and universities.*

A portion of Barnard's intellectual capital lends itself to distance learning opportunities. Barnard should explore these opportunities. To do otherwise will mean a loss of a competitive position in utilizing some of the most current and sophisticated teaching tools. External audiences should be reached through the use of CD-ROM and web-based instructional technology, and by establishing strategic alliances with other colleges and universities. Exploring these opportunities should be done within the context of Barnard's already strong residential experience.

#### Recommendations:

- Develop a distance learning master plan for Barnard. Since the College has very limited expertise in this area, it should seek the advice of an outside consultant who has extensive experience in developing distance-learning programs and can help the College determine the level of effort that is appropriate. Given Barnard's limited resources, it is highly unlikely that we will be able to mount a program that is competitive with what is being produced by for-profit enterprises. We will need to tailor our efforts to focus on our strengths and our most important niches. We will need to explore how important the development of our own distance learning programs is to the public image of the College and our departments, and the extent to which we should be relying on using programs developed outside the College in our own curriculum.

- Encourage interested faculty to revise current or develop new courses in an electronic format, i.e., web-based, to complement current presentational modes and to make these courses more "exportable" as long-distance learning opportunities. This development would be a natural extension of the course development program described above in the section devoted to faculty technology.

- Develop working relationships between BEATL and Columbia's New Media Technology Lab, private foundations, and other peer institutions to promote sharing of resources, expertise, and emerging technologies.

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<sup>6</sup> Given the complexity of Barnard's teaching and research activities, we should also be able to support some hardware and software with distinctive capabilities that may not fall within the "uniform" requirements.

- Develop pilot courses for selected audiences ranging from web-based summer courses for students, non-credit enrichment programs for alumnae, or courses that could be shared with peer institutions offering similar course content. Barnard should also develop on-campus video-conferencing capabilities to explore other opportunities such as broadcasts of faculty lectures as guest speakers from any place in the world.

- Provide for more “development” space in the library that is conducive to working with various types of technology and providing one-on-one training of faculty in state-of-the-art programs and equipment.

- Explore the possible uses of Microsoft’s Netmeeting and other types of communications software that can be used in conjunction with webcams and video to connect computers and people together.

In summary, we envision over the following decade that technology will form a seamless backdrop for learning initiatives, administrative efficiencies, and community life that will enhance, not supplant, Barnard’s traditional strengths as a liberal arts college for women. It is quite possible to imagine in the near future students retrieving email messages, course information, and notices of campus events from hand held computers as they walk between classes. We should work to create an infrastructure to support this vision through careful and focused deployment of staff, spaces, and increased network capacity.