

THE *NEW MEDIA CENTERS* INITIATIVE:

A STRATEGY FOR FOSTERING INTERACTIVE MEDIA
IN HIGHER EDUCATION

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New media---the fusion of technologies and solutions for uniting text, illustrations, photographs, sound, voice, animations, and video in a dynamic new form---has emerged as a powerful catalyst for innovation in higher education. Though still very new, multimedia technology has found pockets of enthusiasm in higher education. From anthropology to zoology (and nearly every discipline in between), faculty and students are turning to new media to explore and develop new approaches to teaching, learning, and communicating their discoveries.

And yet, because the underlying technologies are more complex and more costly than those that triggered the desktop computing revolution, new media is often not well understood, widely used, or truly integrated on college and university campuses. For those reasons, many technologists and educators alike have begun pondering how to spark the next step in the new media revolution: How can the opportunities in new media be extended to more faculty and more students on more campuses'

The answer, for a group of technology leaders and participating universities, is the *New Media Centers* program.

"The New Media Centers program creates a new model that fosters the widespread integration of interactive media in teaching, learning, and communicating"

--Karen Nagy, director of academic information services at Stanford University

In name, the *New Media Centers* program had its origins at the Hakone Forum, held in Japan in the summer of 1992, where leaders from the computing, communications, publishing, and entertainment industries worldwide met to ponder the business and social potential of new media. This gathering urged the creation of a center or centers that would hand off technology from engineers to artists, filmmakers, educators, and others, empowering and involving the broadest possible audience so people could find out what new media can do for them, and more important, what they can do with new media.

Launched at EDUCOM 1993 in Cincinnati, the *New Media Centers* program seeks to implement this goal in higher education. This joint venture founded by

Adobe Systems Incorporated, Apple Computer, Inc., FWB Inc., Macromedia, Prentice Hall, Sony Electronics Inc., and SuperMac: Technology, Inc. is a bold, new initiative, not merely for seeding universities with the hardware, software, and resources for interactive media but for growing new media to its full potential over the long term among faculty, students, and a broader community beyond academia.

The purpose of this document is to review academia's use of digital technologies to date, to explore the need for change, and to examine in detail the mechanisms that the *New Media Centers* initiative proposes for enabling academic institutions to make new media more meaningful on their campuses. It also Profiles the first *New Media Center*, located at Stanford University, introduces the corporate partners involved in the initiative, and summarizes the requirements for universities interested in joining the program.

First-Generation Multimedia: Catalyst for Change in Teaching and Learning

The desktop computer is no stranger on campus.

Hardware and software developers, in the belief that today's computer-using students are tomorrow's computer-using professionals, have since the mid-'80s seeded campuses across the country with products. As a result, today's students are virtually assured some contact with computers. More than 95 percent of the nation's 3,600 college and university campuses have computers in labs, libraries, dorms, and elsewhere. Increasingly, students actually own a system of their own. The median ownership figure is 20 percent and rising rapidly, and student ownership at some colleges is substantially higher - 42 percent at the University of Michigan at Ann Arbor, 70 percent at Case Western Reserve University, and approaching 100 percent at Drew University, where incoming freshmen are given notebook computers, and class assignments frequently require use of software as well as more traditional tools.

Most computer-using students use word processing more than any other application, but the means for going beyond mere words as the lingua franca of academic discourse are increasingly available and attracting widespread interest.

CD-ROM (Compact Disk-Read Only Memory) technology - with the storage capacity essential for accessing a vast amount and variety of information in the form of text, graphics, audio, and video - is proliferating. In fact, industry estimates indicate the total number of multimedia-capable computers equipped with CD-ROM drives may reach 15 million by 1995. Computers with built-in CD-ROM drives, video cameras, scanners, and digitizing and editing equipment, among other components, are more common and accessible. In combination with authoring tools and other development software, these components enable teachers, students, and publishers to combine familiar media in new ways.

The results - from courseware that rewards self-paced exploration to projects that foster new possibilities for group interaction and collaboration -- have

enlivened studies for students at campuses around the country:

Students at Carnegie Mellon University, for example, can simulate chemistry experiments on their computer desktops using an interactive tool called the Just-in-Time Laboratory. At Ohio State University, students of civil engineering use interactive, multimedia courseware to simulate issues in road construction. An extensive library of digitized photographs and technical drawings of landscape design lets students at the University of Illinois examine the elements of landscape design, understand their symbolic meaning, and make comparisons across different cultures. One of many multimedia ventures at Cornell University allows veterinary students to examine animals via computer simulations to perfect their diagnostic skills. Numerous medical schools offer their students patient-diagnosis simulations, multimedia medical atlases, and video surgical procedures on laserdisc and CD-ROM. And classical scholars at many campuses now study Hellenic culture using Perseus, a multimedia CDROM published by Yale University Press that contains 25 volumes of Greek texts (with English translations), a 35,000-word Greek dictionary, and 6,000 photographs and drawings of artifacts and archeological sites.

Thanks to these and other pioneering projects, interactive media has proven its worth to faculty and students. It has proven to computer makers and software developers that there's a large, viable, growing market worth cultivating. It has demonstrated to publishers that the interactive media must be part of enhanced textbook offerings as we approach the 21st century.

Ironically, the burgeoning desire to integrate interactive media in academia comes at a time of economic uncertainty for both colleges and technology companies. The 1990's have become a time of retrenchment, with companies curtailing the donations and grants that were more readily available to campuses in the 1980's.

Purse strings are tighter at universities, too. Some public institutions are strug-

gling with budget cuts of 20-percent or more. Many private colleges are also under financial stress. R.C. Heterick, president of EDUCOM, puts it this way in the September 1993 issue of Higher Education Product Companion: "The institutions of higher education ... are struggling to survive in the midst of ever-tightening fiscal resources."

In early 1993, a group of technology and publishing companies formed a consortium and began meeting to explore new mechanisms for fostering interactive media integration in higher education and in professional markets, mechanisms that could withstand the climate of economic uncertainty, stay abreast of technological change, and extend the benefits of interactive media to a far broader audience.

"We will all compete better if we all cooperate better. Such exchange will help to create a critical mass of players in the new media industry."

-The Beginnings of a New Media Industry. a report from the Hakone Forum

A New Initiative for Interactive Media

The result was the *New Media Centers* program. Based on a long-term alliance between technology and publishing companies and participating universities, the *New Media Centers program is dedicated to providing access to state-of-the-art* interactive media computing technology for faculty and staff, students and alumni, as well as members of the non-academic community. The consortium's goal is to help create 15 *New Media Centers* by the end of the current academic year in at colleges and universities around the country, and by 1996, to increase that number to 100.

The program is unique, *requiring mutual commitments from both corporate and academic partners*. For the six founding companies, Adobe Systems Incorporated, Apple Computer, Inc., FWB Inc., Macromedia, Prentice Hall, Sony Electronics Inc., and SuperMac Technology, Inc. (and others that may participate in the future), the requirements of the program include:

1. Providing extended, preferential pricing for a complementary range of media-related hardware and software, as well as for upgrades
2. Establishing a close, working relationship that makes the *New Media*

Centers true partners in the new-media revolution, with access to the consortium's industry contacts, technology developments, and emerging new media solutions.

3. Involving the New Media Centers in the advance testing and use of state-of-the-art new media products;
4. Steering debate over practical ways to deal with intellectual property issues, distribution, and royalties in the context of new media, and sharing expertise in the process of turning prototypes developed at New Media Centers into viable products for the academic or commercial marketplace;
5. Financing the introduction of the program; and
6. Communicating New Media Centers achievements to other academic institutions, the technology and publishing communities, and to the business world.

The *New Media Centers* can make purchases from any vendor and forge relationships with any publisher. Under the program, there are no limitations in the quest to establish flourishing New Media Centers: the centers are there for all parties interested in helping educators make use of new media. And to further that goal, the consortium may add other technology and publishing partners in the future.

For participating universities, the requirements of the program include:

1. Allocation of financial resources, a facility, and staffing to create, equip, and maintain the center;
2. A commitment to train faculty and students, introduce interactive media into a range of academic disciplines, and develop media-based curriculum materials;
3. Opening the New Media Centers to community access, via workshops and seminars on using interactive media for alumni, business professionals, K-12 teachers, parents, and others; and

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4. Showcasing new media technologies developed by the corporate partners in the New Media Centers program.

Compared with the ad hoc undertakings that typify many of the first -generation multimedia ventures on campuses today, the New Media Centers program represents a highly advantageous model for effectively embracing interactive media in higher education. The New Media Centers program differs on several counts:

- *It offers a practical and stable economic model for acquisition and use of technology.*

Because they don't rely on donations, seed programs, or one-time grants from individual companies, the New Media Centers are less subject to the vagaries of corporate largesse. Participating universities have financial responsibility for their New Media Centers. But in exchange, each campus gets aggressive, preferential pricing from the leaders in interactive media technology.

There are several benefits to this strategy for participating universities. First, it provides the best possible pricing on products that are essential to interactive media. Total configurations, for example, will be below the prices typically available to the education market.

Second, it greatly simplifies purchasing negotiations. Third, because the preferential pricing guarantee extends over time, universities can more readily afford to upgrade their media technology and keep their New Media Centers on the leading edge. As a result, universities can build a more complete base for interactive media computing more economically and more conveniently than before (in contrast to the piecemeal assemblages of equipment and endless purchase-price negotiations).

Other aspects of the New Media Centers program hold promise as revenue producers for participating universities. Workshops and seminars for non-

What equipment does a New Media Center need? At minimum, interactive media work demands a fully configured set of compatible hardware and software, ranging from \$16,000 for a low-end system to \$45,000 at the high end. Essential to any hardware configuration are fast CPUs with lots of RAM, capable of processing and displaying full-color graphics and other media intensive files. In addition, CD-ROM drives, high resolution color displays, accelerated graphics and image processor cards, scanners, computer-controlled video equipment, CD-Write Once mastering equipment, digital-video capture equipment, and disk drives for handling large multimedia applications are essential. Software should include tools for illustration, image manipulation, video and sound editing, animation, modeling, and authoring. The NMC consortium provides a list to participating universities of specially priced products that satisfy these needs.

university audiences could easily generate a return on the initial investment. And new media-based curriculum materials, created by faculty and students and disseminated to other campuses or in the commercial marketplace, could produce a stream of royalties.

- *It's a powerful model for integrating interactive media into academia.*

While there are pockets of achievement, interactive media has not made sweeping inroads on most campuses. Few schools offer degree programs in multimedia applications, interactive telecommunications, and the like. Only a handful of academic disciplines uses interactive media in teaching. Many faculty, staff members, and students are not aware of what they can do with interactive media. Many find that the facilities for using them are still relatively inaccessible or incomplete.

The *New Media Centers* program pulls down these barriers and puts new media front and *center* in participating universities.

The underlying economics of the program plays an important role in making new media truly central to academic endeavor. The financial commitment by universities and the preferential pricing by vendors make inviting, well-equipped facilities practical for the first time.

The *New Media Centers* are inclusive in scope, another departure from many existing multimedia projects. By charter, they serve the varied interests of the whole academic community, not just a few departments. Conceivably, professors and students of forensic anthropology, journalism, linguistics, business management, constitutional law, and other disciplines can all use the center to learn new media technologies and use them to enhance the curriculum for their own academic fields.

Perhaps most important to fostering use of new media in higher education, however, is training and support for interested faculty and

students. It is this commitment that gives the program its unique ability to demystify interactive media and begin integrating it as a powerful, flexible tool for teaching and learning.

Each participating campus is free to interpret training and support in its own way. Some might focus on developing basic skills for working with interactive media: the ability to search multimedia databases, combine and annotate different data types, and create something new --- a new kind of term paper or scholarly article, dynamic course materials, and the like. On a more conceptual level, some might explore issues in repurposing content from one medium to another, in terms of legal constraints or instructional design. Others might teach particular software packages or specific techniques for interactive presentations, graphic design, desktop publishing, or desktop video production.

For faculty, the New Media Centers program provides abundant resources for acquiring new skills in interactive media plus the collaborative assistance needed to integrate new media into their teaching. Students also benefit in several ways. They can gain new insights into their academic studies from new-media course materials. Through hands-on experience with professional tools, they can master skills beyond those associated with specific disciplines, skills that can be hard to acquire in traditional academic settings but that can be vital in the job market.

- *It's an effective model for extending the benefits of new media beyond the university community.*

Interactive media has made the cover of Time and Newsweek. It's the holy grail behind the wave of mergers and alliances sweeping the telecommunications and entertainment industries. It's the hottest investment opportunity in Silicon Valley. In short, everyone's interest is piqued. And under the New Media Centers program, universities have a

unique opportunity to participate in this emerging interest.

The centers are an ideal resource not only for matriculated students, faculty, and staff but also for non-academic "students" - from artists and business professionals to alumni and publishers. According to the Sept. 20, 1993 issue of the *Digital Media* newsletter, "The growing need for focused education in multimedia technologies transcends the university setting ... professionals in the industry [need] a chance to brush up in a specific technology area or forge new relationships with others who share their interests." By leveraging their investment in new media technology and the relationships they forge with industry leaders in the NMC consortium, the *New Media Centers* are well positioned to serve the needs of this broad community.

Workshops for business executives who want a basic introduction to the techniques of interactive, multimedia for presentations Or Corporate training programs; seminars on the impact of new media in publishing or telecommunications or entertainment; or simply hands-on classes on various multimedia- tools are all viable possibilities. Such activities will not only communicate the value of new media to a broader audience but also could generate income that would help the *New Media Centers* be self-sustaining.

The *New Media Centers* can also serve to link participating universities and their media-based endeavors with the large, active community of creative developers who have been attracted to interactive media. This connection will likely prove useful to both universities and developers. Developers may be helpful in suggesting creative ways for resolving technical challenges that the *New Media Centers* may encounter. And the centers may be helpful to developers by providing beta sites for products under development, just to name a few possibilities.

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- *It's an ideal "laboratory "for publishers to experiment with new approaches to creating and disseminating media-based publications.*

As print becomes just one of many media used in higher education, traditional textbook publishing is in the throes of change. Increasingly involved in multimedia, many publishing houses have begun to inject new life into college texts by adding visual and audio components to electronic editions of their textbooks. Some have begun to distribute traditional textbooks electronically to campus bookstores, where they can be printed on demand. Others offer custom publishing services to professors, creating tailor-made anthologies consisting of excerpts and graphical material selected from the texts they publish. Still others provide software tools with their texts, enabling educators to create study aids and presentation materials that dovetail with their curriculum.

"That new media will change education and educational publishing is clear---there are such powerful possibilities when you integrate print graphics, video, and sound. But there is a lot of ground to cover before the potential of interactive media can be realized---hardware, efficacy, copyright, and delivery issues all have to be addressed. The New Media Center program is an excellent opportunity for publishers to experiment in this area with top quality schools and top-quality corporate partners.

---Gary June, Director of Marketing, Prentice Hall

The *New Media Centers* program represents a proving ground for even more fundamental changes. It offers stakeholders - be they scholars, authors, editors, publishers, librarians, distributors at campus bookstores or copy shops, software developers, or hardware vendors - a congenial forum to work through issues in multimedia publication. Consortium members hope a broad range of publishers will look to *New Media Centers* as laboratories where, together with educators, they can work to forge guidelines on such crucial matters as:

- Repurposing already published content for different media;
- Pricing models for the myriad forms that content can now take, and tracking royalties;
- Extending copyright protection to electronically distributed multimedia; and
- Marketing university-created, new-media products.

As the *Digital Media* newsletter observed in its Sept. 20, 1993 issue: "It is only in understanding all the dimensions of distribution, production, and

funding across all the industries touched by multimedia that we will move successfully into the new world ... this technology will Create."

NMC In Action: Stanford's Media Integration Lab

The first *New Media Center* is the Stanford Media Integration Lab for Education, or SMILE. Part of Stanford University's Meyer Library Media Resource Center, SMILE consists of a computer classroom, Curriculum Development Lab, and a public computer cluster. In the classroom, instructors can demonstrate computer usage on a large, projected screen display while students work at individual computer stations. In the CDL, faculty and students create instructional multimedia applications using text, audio, still image, and video digitizers; authoring systems; and CD-ROM production equipment. The public cluster has 50 networked Macintosh Centris 650 systems with CDROM drives that can be used by students. SMILE is co-located physically and organizationally with the Libraries' Media Center (collection and viewing facilities) and its Language Lab.

SMILE serves as:

- ❑ A laboratory where faculty, students, and staff can collaborate in developing integrated media materials for academic departments including Communications, Art, Anthropology, Education, Languages, Drama, as well as for such support programs as the Center for Teaching and Learning;
- ❑ A classroom for faculty, students, and members of the university community to receive hands-on instruction in interactive multimedia production and use;
- ❑ A computer cluster where students can work with multimedia applications and produce interactive media projects of their own;
- ❑ A site for demonstration stations showing specific hardware and software applications and solutions; and

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- ❑ A permanent home for the Stanford Art Directors Invitational, the Stanford Professional Publishing Course, and other workshops presented by the Stanford Alumni Association or other Stanford organizations that attract a broader audience beyond the university.

SMILE has already begun to work with the faculty to develop curriculum materials. In the Winter '93-94 Quarter, two new courses will feature a "dynamic syllabus." One is a history of science course on Silicon Valley, the other a class on Elizabethan theater called "The Renaissance Project."

Each class utilizes a powerful and flexible database customized with multimedia source material. "The Renaissance Project" database, for example, contains images of theater sets, costumes, and scenery scanned from books, as well as text and other data. The Silicon Valley database encompasses newspaper articles and books about entrepreneurs, among other resources. Both are baseline databases; that is, they contain a basic set of resource materials and can be annotated and expanded by the students. That's why Barbara Maliska, director of Academic Software Development (ASD) at Stanford, refers to the syllabus as dynamic. "By having students research and prepare it, the students gain insight and *understanding*," she says. "Passive viewing of prepared materials does not lead to the same result in learning." The ASD group develops software for instruction and research, including the Multimedia Database used in the new course offerings.

Charles Kerns, director of both SMILE and the Curriculum Development Lab, believes that "integrated media provides full access to such research materials as anthropological videos, art reproductions, and performance recordings. Full access," he explains, "means that students will be able analyze, cite, annotate, compose, and collaborate using integrated media sources, as easily as with text."

In classes where students have had this type of access, instructors reported better performance, Kerns notes. One such example is "The Art of Persuasion," a mul-

timedia project in which students conduct a fine, grained analysis of the rhetoric of Martin Luther King's and John F. Kennedy's speeches.

The Stanford Media Integration Lab for Education is a response to longstanding interest in interactive media among Stanford faculty, staff, professional -school students, graduate students, and undergraduates. Two campus undertakings in particular underscored the need for a New Media Center.

One of these was the Image Archive Project, an effort to digitize and catalog some faculty members' 35 mm slide collections and make them electronically accessible. As interactive media technology advanced, the project evolved into the Multimedia Database Project, presenting not only slides but also text and other video/audio materials. This project provides a mechanism for searching the database, multiple interfaces for presenting its contents, and the means for sharing information among learners. The project requires high-end technology for implementation and delivery - a need well met by SMILE.

The other spur for Stanford's *New Media Center* has been the activities of the Stanford Alumni Association and its director of strategic planning, Della van Heyst.

Soon after the introduction of the Macintosh computer, van Heyst began offering evening workshops through the Alumni Association to introduce people to the new desktop technology and its potential in the communications field. "I saw the computer as a leading-edge tool ... and I felt that if communications professionals were not familiar with computers, then I was doing them a disservice," van Heyst recalls. That was the inspiration for the Stanford Art Directors Invitational, the renowned, hands-on technology conference that is entering its ninth year.

"We see this technology as an unprecedented opportunity to extend and improve the quality of education. We want to be in the forefront in using it in our fields"

---Decker F. Walker, Professor, School of Education at Stanford University

She also found technology playing an increasingly important role in the prestigious Stanford Professional Publishing Course offered in the summer by the Alumni Association. "These two programs got us more and more into technology, and yet we had no technology center," van Heyst says. "I also became more familiar with technology, too. K-12 teachers, for example, are looking for ways to become more familiar with educational software and to integrate new media in their classrooms. Another group is parents of young children, who need a place to come and become acquainted with new media in a hands-on fashion so they can keep up with and guide their kids.

"All these needs pointed us in the direction of a center equipped with high-end hardware and software that could be available to teach our own students about new media in a more formal rather than ad hoc way and provide a service to a larger community," says van Heyst.

In 1994, SMILE will be the site not only for the Art Directors Invitational and publishing program but also a three-day conference on new media for education.

Joining the New Media Centers Program

The *New Media Centers* consortium has published a Request For Proposals, inviting applications from other institutions that want to expand their current commitment to interactive media or launch a multimedia program for the first time. All institutions are eligible - small as well as large campuses, public or private, specialized or multi-disciplinary, two- or four-year colleges. The RFP contains details on selection criteria and the selection process, as well as general equipment guidelines for creating a state-of-the-art media center.

The NMC Consortium

The New Media Centers program was founded by a group of companies that have made fundamental contributions to interactive media in their respective fields. Individually, each company has been active in promoting interactive media in higher education. And in many cases, two or more of these industry

leaders have teamed up to offer special programs to universities. But by collaborating as a group and designating the New Media Centers program as the vehicle for corporate support of new media at the university level, they believe they can encourage more schools to embrace, and benefit from, new media more quickly than now possible.

Adobe Systems Incorporated, headquartered in Mountain View, CA, develops, markets, and supports computer software products and technologies that enable users to create, display, and communicate electronic documents. The company licenses its technology to major computer and publishing suppliers and markets a line of type and application software products.

Headquartered in Cupertino, CA, Apple Computer, Inc. is a leading provider of advanced personal computer systems to education, business, government and the home, and a recognized innovator in the personal computer industry. Apple offers a wide range of new-media products including the Apple Macintosh line, QuickTime architecture, sound systems, multimedia upgrade kits, bundled new media solutions, software tools, and multimedia titles.

FWB Inc., based in San Francisco, provides high -performance mass storage for multimedia and digital-video applications. FWB's product line includes RAID disk arrays, hard disk, magneto optical, SyQuest, CD-ROM, and DAT subsystems as well as the SCSI JackHammer SCSI-2 accelerator card and RAID ToolKit array software.

A leader in multimedia software, Macromedia offers a full range of products for the Macintosh and Windows platforms. The San Francisco-based company's products include: Authorware Professional, an authoring tool for interactive learning; Director, an animation and authoring tool for multimedia production; MacroModel, a 3D modeling tool for multimedia, graphics and product design; and Action!, a business presentation application for motion,

sound, and interactivity.

Prentice Hall is a division of Paramount Publishing, the publishing operation of Paramount Communications, Inc., a global entertainment and publishing company. Paramount Publishing has significant operations serving the consumer and business, technical and professional markets and is America's leading publisher of educational materials.

Sony Electronics Inc., with more than 120 facilities in 25 states, encompasses the research and development, industrial design, manufacture, marketing, sales, and service of a wide range of consumer, professional, and industrial electronics products, and magnetic media. Sony is a leader in the integration of computer and audio/video products in the emerging multimedia market. Sony's innovations in multimedia include the Video System Control Architecture Protocol (VISCA) used in the Vdeck computer/video drives and the Vbox computer/video interface; and recordable CID technology, which is featured in the CDW-900E double-speed write once subsystem.

SuperMac, based in Sunnyvale, CA, designs products that accelerate and enhance the performance of desktop computer systems used in the color-publishing, digital video, and digital photography markets. Its products include digital-video capture equipment, accelerated color graphics cards, image-processing accelerators, and large-screen color displays, among others.