Strategically Implementing New Media:
Just Say Yes!

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Abstract

On March 25, 1996, California State University, Long Beach opened its New Media Center, a twenty thousand square foot facility dedicated to the support of the community of learners. The center, and the programs that are fundamental to its success, developed over a five year period that included a major economic recession. This paper is a case study of the creation of the programmatic and physical components that made it possible to increase the effective use of technology for learning and teaching during difficult budget times. Much of the success of the program is due to an entrepreneurial and opportunistic approach that established partnerships both within and external to the university.
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Technology Innovations And Economic Crisis Creates Challenges
During the first decade of the personal computer, many educators intuitively knew that technology could play an important role in education, but the barriers to implementing it were large. In 1991, the technology became sufficiently robust to allow faculty and students to begin to use multimedia for teaching and learning. Apple’s QuickTime digital video, affordable video capture boards, removable storage and Graphic User Interface based authoring tools made it possible for the lay person to develop simple new media instructional software. Another technological breakthrough that allowed multimedia to be brought into the classroom was the development of the full color active matrix LCD panel. These panels were relatively inexpensive, portable, and combined with brighter overhead projectors, allowed for photographic quality images and video to be projected large enough for an entire classroom to view. These technological innovations created new educational opportunities that were particularly significant for California State University, Long Beach (CSULB) where the primary mission is to promote student learning. 1991 was also the beginning of a major recession in California, and the state funded CSULB felt the first major impact in its 1991-92 budget. Across the board cuts of nearly fifteen percent left the university with difficult decisions that pitted preservation of jobs against traditional acquisition of technology. Most of the colleges chose to cut funding for equipment and eliminated technical staff positions in order to protect faculty positions. The Academic Computing Services’ (ACS) budget was reduced nearly thirty percent in the first year and more than 60% over three years. Computer equipment purchases were reduced to an insignificant level in order to protect ACS staff. The convergence of technological innovations and the budget crisis created a tension that forced ACS to redefine its role within the university. The demand for technology to support learning and teaching continued to grow in spite of the recession. To be responsive to the needs of the faculty and students, ACS had the challenge to create a low-cost, high-service technology environment. It was also necessary to develop strategies that would get the greatest return on the “technology dollar” expended, and would attract commercial and institutional partners. We needed a shared vision of where we were going in order to get “buy in” from the campus community.

Carpe Diem!
The first opportunity to advance our strategy came early in the fall semester of 1991. The campus Deans viewed a multimedia demonstration in a commercial facility where many of them were introduced to the interactive nature of multimedia. After the demonstration, the Deans asked ACS to provide CSULB faculty with similar interactive learning capabilities. ACS responded by developing a mobile multimedia cart that would allow any room on campus to use multimedia presentations. With the help of some equipment loans from Apple Computer, Inc. and some campus resources, the ACS staff built a prototype multimedia cart.

Putting The Cart Before the Horse
Bringing the technology to the people with the cart rather than herding the people to the technology optimized our flexibility to provide access to multimedia, and made its implementation cost effective. An interdisciplinary design team composed of ACS staff, faculty, and students defined the requirements for this first critical product. The goal was to create a flexible technology system that would:
• Integrate all the components necessary to create and present multimedia
• Integrate the components in a way that was easy for the user to operate
• Support cross-platform standards
• Be easily moved across the campus by one person
• Be cost effective
• Market the technology to the campus
• Leverage partnerships with the private sector

A standard hardware configuration was adopted as a fundamental strategy for the project. This approach reduced the necessity for training on multiple platforms, making the cart less expensive to support (see Figure 1).

Implementing A New Strategy

Initially the cart was used to make faculty and administrators aware of the capabilities of multimedia. The first public demonstration was at the Dean’s Council, the group who made the original request. Through the Deans, we were invited to demonstrate the cart at department meetings and special gatherings. These activities generated increased interest. For example, faculty wanted to use the cart as part of their teacher-centered, lecture approach to instruction. Generating an increased demand for technology resources (like the multimedia cart) during a period of downsizing seemed inherently dangerous, but it was a necessary part of our strategy to gain administrative support. Our entrepreneurial approach had risk, but it was the only viable option to bring multimedia to the campus.

Leadership & Partnerships Make The Difference

This strategy and the resulting publicity paid off in April of 1992 when the President of CSULB asked ACS to prepare a proposal to use the cart as a centerpiece to implement multimedia for learning and teaching. The proposal contained three key components: the multimedia cart, multimedia development stations and multimedia delivery stations. Because the mobility of the cart was central to our strategy, we named our proposal Multimedia in Motion.

The Multimedia in Motion proposal argued that people would be more willing to accept change when it is gradual, moving from the familiar to the unfamiliar. The media cart would allow faculty to continue to operate in a teacher-centered setting, using multimedia to deliver digital versions of slides, transparencies and film clips that they have collected over the years. As faculty discovered the flexibility of the system, they would begin to develop ways for their students to use multimedia to learn in a student-centered, project-based learning model. This approach would increase the opportunity for students to accept responsibility for their basic learning and free faculty to concentrate on teaching critical thinking and complex concepts. The President chose to make the proposal a campus priority and was willing to back his commitment with funding.

The total cost of phase one of the Multimedia in Motion project was $312,000. Of that, the President designated $200,000 for the project and Apple Computer, Inc. donated $112,000 in equipment. Benefits to Apple Computer included:

• Increased sales of Macintosh computers
• A highly visible model for delivering multimedia in a cost effective manner
• A location that could be used to demonstrate both the equipment and the model development of documentation and training strategies for the use of the mobile multimedia carts
• Presentations of the model at professional meetings
• Having an Apple product accepted as a standard at CSULB

CSULB benefited by providing:

• Faculty and students with multimedia carts to support lectures
• A multimedia development facility where teams of faculty and students could create multimedia
• A classroom of computers where students could run multimedia packages
From Experimental Projects To A Maturing Program

The Multimedia in Motion project stimulated much interest across the campus. The number of faculty involved and products generated in the project began to increase. More faculty began to use the carts for classroom instruction and some students were beginning to use multimedia as a medium for their assignments. A program was taking shape and support for multimedia in learning and teaching was growing, both from the grass roots up and from the top down.

By the fall of 1993, multimedia was well established at CSULB. In a period of nine months, nearly ten percent of the faculty were involved in the production, training or use of multimedia for teaching and learning. The success of the program was leveraged to bring additional resources to the university. Each year ACS generated more resources than the operational funds allocated by the university. Our paying customers included the CSU system, academic programs within CSULB, and the private sector. In some cases, ACS brokered “deals” between the private sector and other units within the university. Although ACS did not receive funds for being the matchmaker, there were always indirect benefits.

Becoming A New Media Center: In November of 1993, a group of seven technology and publishing companies announced the creation of the New Media Centers Program. The goal was to develop an academic-industry collaboration that would help academia implement multimedia by providing information and special discounts to the academic partners. The intent was to help the academic partners become leaders in the development of new media for education. Membership in the New Media Centers Program was on a competitive basis. The RFP made it clear that the consortium was looking for a select group of academic institutions to implement the program.

On March 1, 1994, CSULB received national recognition for its work in multimedia by being chosen as a charter member of the New Media Centers Program. This recognition by a national program opened new opportunities for partnerships with the private sector and across the university. The discounts offered by the commercial partners became additional tools to leverage the efforts of the program.

Finding Space To Expand: A significant opportunity for cooperation that would benefit the entire campus became apparent as soon as CSULB received New Media Center status. CSULB had dedicated a new “electronic library” building nearly four years earlier, with a plan to make the transition into the world of digital information. Just after the dedication, the budget crunch hit, and for four years the building was used primarily as a student study area. By combining the successes of the Multimedia in Motion project and the membership in the New Media Centers program, it became apparent that the New Media Center operations could be located in the North Campus Library building. Some careful planning allowed the North Campus Library to be modified in a way that served the needs of the users of new media and the objectives of the electronic library. It was a classic win-win situation. The New Media Center would have sufficient space to serve a large number of students, and the library would have the physical facilities to implement an electronic library, all using common space and equipment. The need for extensive duplication of resources had been eliminated. Although the plan was viewed as a positive one, it did not receive significant funding and took nearly two years to complete.

By March of 1995, the New Media Center at CSULB continued to make progress in building a sound program. The national office of the New Media Center Program chose CSULB to be the host for the first annual summer conference. By that time the number of academic partners had risen to fifty-three, and they were all represented at the week-long program held on the CSULB campus in June, 1995. This event opened additional opportunities for new synergistic partnerships with other universities and with the commercial technology partners. Some other highlights of the year included:
Apple Computer Inc. worked with the CSULB New Media Center staff to prepare a CD ROM of interactive multimedia products produced at CSULB, and used it as a gift from Apple to the 1994 EDUCOM conference attendees. Apple chose CSULB to highlight from among the twenty-two charter members of the New Media Centers Program.

The New Media Center Office in San Francisco prepared a video to inform EDUCOM attendees about the New Media Center Program. CSULB and Georgia Tech were featured in the video which was distributed across the country by the New Media Centers Office.

CSULB received a $118,000 grant from the DELTA project of the California State University to develop a digital database of images, diagrams, animation, video and sound that is available on the World Wide Web. The database is called the Global Campus and can be viewed at http://www.csulb.edu/gc. The project enables members of the academic community to make special collections of information they own accessible to students and faculty at CSULB, and around the world. In some cases, it is being used to add value to investments that the university has already made. For example, a collection of electron micrographs that cost in excess of one million dollars to develop, and was being stored in a file cabinet in the faculty member’s office, is now accessible to faculty and students at CSULB and around the world. Students and faculty benefit by having access to a large amount of digital information that is copyright cleared for educational use, and is available for the development of interactive multimedia in a manner that is both legal and ethical.

A number of new partnerships were developed with the private sector.

Adobe/Kodak worked with the CSULB New Media Center to produce a presentation series called Multimedia for the Uninitiated. This program, which highlighted educational uses of Adobe and Kodak products, was presented at eight universities across the country.

Network Peripherals, manufacturers of switches and high speed communication cards for computer networks, choose CSULB and its New Media Center to develop a model network for the transmission of new media. The partnership was important in building the New Media Center facilities.

Addison Wesley Longman chose CSULB to be one of its five national training centers for their interactive multimedia program, ADAM.

Beta testing software for publishers and researchers provided additional opportunities. One area of particularly productive work was in the testing of intelligent tutors for remedial math courses. Working with two publishers and two research laboratories, CSULB students demonstrated that intelligent tutors can improve the quality and quantity of learning.

While the above activities were happening, we were busy building the New Media Center in the North Campus Library. The plan was to use 20,000 square feet of space to build three separate but functionally related facilities, a New Media Development Center, a New Media Open Access Center and a New Media Training Center.

Remodeling A Home For New Media

Creating the New Media Center in the North Campus Library building required significant changes to the physical structure. A new transformer was necessary to upgrade the electrical power plant. This guaranteed ample, and clean, power to all of the computers in the Center. The furniture was designed to promote collaboration among users and to support working environments that are emerging in the commercial sector. We needed to build a robust network with high bandwidth since much of the net based New Media instructional software utilized digital video, photographs, and sounds. We designed and installed a flexible network that could easily be maintained and upgraded as the technology and funding became available.
The New Media Development Center is 5600 square feet in size and has over 40 stations that facilitate students and faculty in producing original learning and teaching materials. Staff provide technical support and design consulting to help develop student-centered learning projects. The New Media Open Access Center is 12,800 square feet and opened with more than 70 networked computers to provide an on-ramp to the Information Superhighway in the distributed electronic library. Access to multimedia instructional materials and digital information resources provide students with access to a large variety of remote resources. The New Media Training Center provides training for the campus, education and business communities on the latest multimedia technology, methodologies, and applications. In creating three functional areas to support development, access and training, we used a systems approach that allowed both the New Media Center and the University Library to accomplish their goals. Technology, campus facilities, the ACS mission and its personnel were rapidly transforming into a new organization that could serve the educational mission of the university in innovative and productive ways.

Involving the faculty in integrating technology in instruction was a critical activity which we conducted in parallel with the rest of our program. Because faculty develop, control, and deliver instruction, ACS needed to collaborate with faculty in implementing any technology program related to teaching and learning. Without the faculty understanding and believing in the potential of new media, the technology would remain peripheral to the students’ learning experience.

Developing The Educated Consumer- The Faculty

In the early 1980’s, institutional computing services (such as ACS) primarily supported faculty in their research activities in the natural, social, and behavioral sciences. At CSULB, ACS maintained the statistical packages for data analysis and operating systems for specialized programming languages on the mainframe, provided training of productivity tools (such as word processors) and managed the campus email system. Overall, ACS provided well-defined computing support services to expert users, faculty and graduate students who had well-defined goals and who’s actions produced valuable and well-defined outcomes.

Innovations in technology and the spread of expertise in using productivity tools throughout the faculty community changed the original role of ACS. Statistical packages and improved programming languages, user-friendly word processing and graphing tools could be effectively run on workstations in faculty offices rather than on ACS mainframes. The number of faculty who were regularly using technology had increased to a point where faculty needing assistance could walk down the hall to a colleague or use computer-based training integrated into the productivity tools to get a technology question answered. The faculty were becoming more self-sufficient in conducting their research activities. Consequently ACS significantly reduced their offerings of productivity tool, operating systems and statistical packages workshops, and focused their energy on technology-mediated instruction and learning.

There were major differences in the characteristics of the faculty who would become the “clients” or customers of ACS. Even though the research and teaching faculty are frequently the same people, the transition to the teaching/learning focus led to significant changes in the way ACS would have to strategically provide it’s services. The table below contrasts these changing client characteristics.
<table>
<thead>
<tr>
<th>1980's: Focus on Research</th>
<th>1990's: Focus on Teaching and Learning</th>
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</thead>
<tbody>
<tr>
<td>Research Faculty were from a limited set of disciplines, were involved with ACS and the differences in the disciplines did not have any significant impact on the utilization of technology</td>
<td>Teaching Faculty are from all disciplines and the differences in disciplines have a significant impact on the use of technology. Teaching students to write is different from applying accounting principles</td>
</tr>
<tr>
<td>Research faculty used computers for computational purposes (alpha-numeric processing)</td>
<td>Teaching faculty use computers for computations, presentations, teaching &amp; testing, communication &amp; feedback purposes (alpha-numeric, text, &amp; graphic processing)</td>
</tr>
<tr>
<td>Research Faculty clearly understood the use of computers to achieve their research goals</td>
<td>Teaching faculty do not understand how computers could be used to achieve their teach/learning goals-which were ill-defined</td>
</tr>
<tr>
<td>Research Faculty were dependent upon technicians to provide the specific procedures for using and upgrading the mainframe and operating system language(s)</td>
<td>Teaching faculty are not dependent upon the technical staff to provide procedures for teaching. High-tech teaching have to compete with habitual and substitutable low-tech, teaching procedures</td>
</tr>
<tr>
<td>Research faculty were able to quickly and reliably know if the technology was producing research results</td>
<td>Teaching faculty are not able to quickly and reliably know if the technology is producing learning results</td>
</tr>
<tr>
<td>Research faculty were rewarded for advancing their research goals with tenure and promotion</td>
<td>Teaching faculty are not rewarded for advancing their teaching goals with tenure and promotion</td>
</tr>
<tr>
<td>Research faculty frequently traveled to the computing facilities and staff</td>
<td>Teaching faculty travel to their classrooms and not to computing facilities &amp; staff</td>
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**Demo or Die**

The multimedia cart became a critical communication devise to educate faculty about the potential use of technology for learning. Our first and most important strategy for developing our educated consumer was: **Demonstrate rather than talk about new media technology and how it can impact learning.** Our experience has been that people understand what New Media is more completely and accept it’s potential to improve learning when they see credible examples. These examples are also more meaningful when they are discipline based. We came to understand that wherever possible, we needed to show discipline specific examples and to articulate the anticipated benefits of using a particular technology for that discipline. Making the assumption that the faculty would understand how to apply new media to their discipline was inappropriate in many cases.

**Learner-Centered, Project-Based Faculty Development**

Our training offerings was another strategy for educating faculty. Workshops on multimedia authoring and tools to manipulate media elements like sound, video, scanned images, and hypermedia became the focus. This media rich, interactive authoring environment represented a new language which was not readily understood by faculty. Staff using technical terms and including irrelevant details compound the difficulties in educating faculty. We developed the following principles to ensure successful training sessions:

- Hands-On Project Based Learning (learning by doing)
- Eliminate technical jargon and use the language of teaching & learning
- Show meaningful examples
- Leave out unnecessary technical detail (just enough detail)
- Offer guidelines and rules of thumb for technology uses
• Select tools that are easy to use

The Center for Faculty Development became a critical collaborator with ACS, and thus validated ACS’s involvement in shaping innovations to teaching and learning processes. ACS and the Center for Faculty Development currently co-sponsor a program of workshops titled, “Enriching the Learning Environment with Technology”. The workshops are now jointly taught by CSULB faculty members and ACS staff members, and we’ve adapted the local YMCA swimming lessons approach to our technology training. Participants decide if they are a pollywog, guppy, fish, or shark, and then register for the workshop designed to meet their needs, skills and comfort level; a pollywog is getting comfortable with the software; a guppy is learning to apply software features, a fish is beginning to use advanced software features, and a shark is a competitive user. Adapting the training to the expertise level of the user has become a productive strategy for getting larger groups of faculty involved in new media.

Hands-on project based learning was a key principle that guided the training process. We begin the workshop series with a group discussion about learning problems rather than technology. We spend the first three days of the workshop in a traditional classroom, away from computer technology, assisting the faculty in identifying and thinking about the learning problems their students face. The emphasis on learning rather than on what can be done with technology. We spend days two and three brainstorming solutions and prototyping interface mockups of their new media projects, using pencil and paper rather than computer tools. Participants kept focused on their ideas rather than on trying to learn a new technology tool.

Faculty construct a new media product and the “trainers” facilitate the new media development process. Furthermore, faculty working on projects that were directly related to their instructional mission and disciplines tended to be more motivated.

We started with the idea that faculty would be new media authors, functioning as both the content expert and the new media developer. Over time, we learned that it is the rare faculty member who has the interest, the time, and the talent to be both of these things. Beginning with the New Media Summer Intensive workshop in 1992 we began to encourage the formation of project teams to attend the workshop and develop projects. A project team consists of one person who is primarily the content expert, usually a faculty member, and another person who is a technical partner, usually a technically oriented faculty member, staff, or graduate student from the same discipline. These two work together and often bring in others to be part of the team as necessary. The collaborations created in the teams frequently developed the instructional design skills of all partners.

Funding Teams To Develop Projects

As a result of our early successes, we were able to get funding from a variety of sources to support the development of additional new media. Some of these moneys came from faculty development sources because of the recognition that developing instructional software helped faculty examine their teaching and the student’s learning in new ways. These faculty development benefits have been one of the primary reasons for the collaboration between the Center for Faculty Development and the New Media Center in putting on workshops and supporting software development and testing.

Because of the highly complex and dynamic nature of interactive media we decided to take a different direction from the traditional written proposal model for the distribution of funds. Recognizing that it is easier to talk (or write) about interactive media than to actually produce something, we required the applicants to demonstrate a prototype of their project in order to get funded. Consequently, we funded faculty who had already shown a commitment to working on a project by producing a prototype. Faculty often produced these prototypes by participating in our New Media Intensive workshop.
Building the Credibility of New Media

One of the risks in developing new media is that the effectiveness of the product as a learning tool is difficult to predict. Why should public and private institutions invest in personnel, facilities, projects and publicity if they don’t really know the risk of failure or chances for success? At CSULB, the Center for Faculty Development, the Psychology Department, and ACS collaborated to create the Center for Usability in Design and Assessment (CUDA). The goals of CUDA are: (1) Support the development and implementation of New Media at CSULB, other CSU campuses, and private industry; (2) Develop empirically-based standards and procedures for usability testing. Usability testing determines how easy it is to use the software, whether the user achieves his/her goals with the software, how easy is it to learn to use the software, and whether the user enjoys using the software; (3) Conduct and publish research investigating usability testing methods and performance/learning outcomes of software use and (4) Train students, staff, and faculty on usability testing methods, user-centered interface design, and human factors project management. CUDA has become a service center to help ensure the quality of the new media. We work with developers (frequently teams of faculty, staff, and students) to design the interfaces and program elements that reliably produce the desired learning outcomes.

Hindsight

With its changing mission and clients, ACS engaged in some strategic planning, even though it wasn’t labeled as such. In hindsight, the following concepts and questions frequently emerged in our discussions throughout the transformation of ACS. These questions and their answers will shape the development of any institution strategically implementing new media.

1. **Purpose:** Who do you serve? What are their common goals? What services do you provide and toward what goals?

2. **Problems:** What are the current circumstances and how are they different from your desired circumstances (your goals)?

3. **Products:** What are the items that other people can value?

4. **Personnel:** Who is responsible for fulfilling the mission?

5. **Partners:** Who do you have to collaborate with to achieve your goals?

6. **Processes:** What are the general strategies that you use to solve your problems?

7. **Projects & Programs:** What are the specific activities you have implemented to fulfill your mission and achieve your goals?

8. **Participants:** Who are your customers that will value and “buy” your products and services?

9. **Publicity:** How and what will you market/communicate to your participants, partners, funders?

10. **Facilities:** What are the environmental assets and constraints (facilities, equipment, infrastructure, etc.) that affect the other concepts?

11. **Funds:** How do you get enough money and how must you spend it?

When institutions begin to answer these questions for themselves, it is critically important to map out and create coherent relationships between all these elements. Strategically implementing new media is creating an integrated system and not an isolated facility or program. Some of the lessons we learned at CSULB are:

- The single most important condition for success was to develop an environment that focused on learning as the issue
- We were successful because we found ways to turn the problems into opportunities
- We used the program to leverage resources for the university that would have otherwise not been available
• We discovered that the necessary personnel included staff, faculty and students, working in collaboration and as a “community of learners”
• We formed long term, win-win relationships with our partners and always delivered more than we promised
• We were entrepreneurial and opportunistic, funded action, and required accountability
• We used our project to leverage additional resources
• We actively marketed our project

In retrospect, developing trust in the relationships between the people who will become your partners and invest in your program is critical. By delivering what we promised with the multimedia cart and by focusing on teaching and learning with the faculty we build trust with our collaborators.

![Mobile Multimedia Cart](image)

**Figure 1**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacSpeakers</td>
<td>MS-1 Stereo Speakers</td>
</tr>
<tr>
<td>Apple</td>
<td>14-inch monitor</td>
</tr>
<tr>
<td>RasterOps</td>
<td>24 STV Video Card w/MoviePak Daughter Board - 30 fps video</td>
</tr>
<tr>
<td>Hammer</td>
<td>SyQuest 200 MB Cartridge Drive</td>
</tr>
<tr>
<td>Apple</td>
<td>Macintosh Centris 650 24 MB RAM 1GB internal HD Internal CD ROM Drive</td>
</tr>
<tr>
<td>nView</td>
<td>ViewFrame Spectra Plus Color LCD Projection Panel</td>
</tr>
<tr>
<td>DuKane</td>
<td>4003 Overhead Projector</td>
</tr>
<tr>
<td>Fostex</td>
<td>M N-50 Sound Mixer</td>
</tr>
<tr>
<td>Sony</td>
<td>SLV-R5UC S-VHS VCR</td>
</tr>
<tr>
<td>Pioneer</td>
<td>CLD-V2400 Videodisc Player</td>
</tr>
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Illustration by Shari Cheves