

• FETC 2000 CONFERENCE OVERVIEW • PRINTERS • EDUCATION PORTALS •

# T · H · E Journal

TECHNOLOGICAL HORIZONS IN EDUCATION FEBRUARY 2000

## TECHNOLOGY INTEGRATION

PLUS...

### FETC 2000

20TH ANNIVERSARY SPECIAL COVERAGE

Visit Our FETC Online Conference Planner

[www.thejournal.com/conferences/fetc](http://www.thejournal.com/conferences/fetc)

### Successfully Managing the Technology Design Process

by Paul Corraine, Convergent Technologies Design Group

The rapid-fire release of new and improved technologies has triggered an explosion of educational applications, sending demand for these technologies soaring in colleges and universities. Students are clamoring for high-speed Internet connections and computer access. Instructors are calling for sophisticated audiovisual presentation systems. Administrators are pressing for videoconferencing and distance learning capabilities.

Most higher education institutions have talented technology experts - technology directors, deans, professors and staff - with the knowledge and skills to oversee the design and installation of new technology systems. However, with a finite number of hours in the day, many technology-savvy faculty and staff simply do not have the time to heap a full-time technology design project on top of their regular workloads.

To implement new technologies without overburdening busy staff and faculty, many colleges and universities have recruited a new player to serve on their technology teams: a technology design firm. Technology design firms offer an array of services to help public and private higher education institutions of all sizes design and implement new technology systems. These services include master technology planning, telecommunications cabling,

audiovisual and acoustics design and data network design.

Whether a school is constructing a new building or retrofitting a room, many educators have found that a technology design firm can help maximize limited resources. "We often have dual roles: to consult on the building and building process, and to run an office," says Kathleen A.M. Dooley, associate

**Keeping up with the technology industry can be a full-time job in itself.**

director of media resources for Midwestern University, which has campuses in Glendale, Ariz. and Downers Grove, Ill. "Working with a technology consultant is a great relief of stress. They can focus on one project, as opposed to me with 25 projects and personnel issues."

Aside from managing projects, keeping up with the technology industry can be a full-time job in itself. Technology design firms visit trade shows, read trade publications, participate in professional associations, and network with other industry experts. By keeping abreast of changes and developments, a technology

consultant can provide the up-to-the-minute knowledge necessary to successfully manage a design project from beginning to end.

The rapid pace of the technology industry has produced tangible benefits for budget-conscious schools. Across the board, product capabilities and performance are escalating as costs are falling. "In recent years, rapid advances in multimedia projection technology have significantly increased resolution while reducing cost," notes Tony Berry, director of channel sales at Proxima Corp. "Although XGA resolution is common in professional conference centers, it used to be considered cost-prohibitive for schools. Today, XGA projectors are widely utilized in auditoriums and lecture halls alike, providing instructors with remarkably brighter, clearer images at a fraction of the old price. Keeping up on the latest technologies has definite benefits for schools, both in terms of product quality and cost."

"We expect a consultant to show us the latest, most innovative and most sound technologies. We need someone to be out there in the industry because it changes so quickly," explains Dr. Mary Vanis, campus dean at Mesa Community College at Red Mountain in Arizona. "We expect a consultant to be more familiar with what's available than anyone in the institution."

## Selecting a Technology

### Design Firm

"The best way to find a consultant is to talk to other universities. See their work and what obstacles they've overcome," says Dooley. "At the same time, be aware of what your needs are. Be sure to have a clear idea of what spending is going to be, because that will help the consultant and vendors determine where to go. "A technology design firm may be hired directly by a school or by the architect spearheading the construction or renovation project. When evaluating firms, it is important to determine how well their services and experience match the school's needs. Some firms focus on specific markets, like higher education. Others serve a broad range of clients, designing systems for everything from Fortune 500 business offices to courtrooms to classrooms.

It is important to determine if the firm has expertise in the types of rooms and spaces that would be found on a typical college or university campus. Then, determine if the firm has completed projects of similar scope and size for other schools. Consultants that work with many higher education clients can be a wellspring of information on what other schools are doing with technology. Also, the goals of the people who will ultimately use the technology systems are particularly important in the analysis of a firm. Be sure the technology consultant has a clear understanding of the pedagogical needs of the institution and the specific departments that will be using the systems.

The technology design process is truly a team effort. A technology consulting firm does NOT take the place of the school's own technology experts. Their talent and experience are critical to the success of the design team. Many schools select several representatives to serve on the design team and work with the consulting firm. Representatives might include the dean of a school or department, assistant dean, key instructors and chief financial officer, for example.

Regardless of who serves on the team, it is essential that all participants take ownership of the project. Design team members and stakeholders should collaborate to ensure that the school gets exactly what it wants, on time and on budget. Keeping an open channel of communication throughout the project is vital to the team's and the project's success. "It's important to understand reporting responsibilities and to clarify communication links up front," says Vanis. "If issues or new ideas or directions arise, it's important to know who needs to be in the loop."

### Participating in the Technology

#### Design Process

The technology design process has five key phases:

1. Schematic Design
2. Design Development
3. Construction Documents
4. Bidding and Negotiations
5. Construction Administration

During each phase, the technology design firm and school representatives work closely together to

collect, document and verify information to create a smooth transition from one phase to the next.

### 1. Schematic Design

During Schematic Design, the technology design firm verifies the institution's "program." A program is a document that defines the parameters under which a building will be constructed or renovated. It describes the programmed use of the building, layout and associated costs. The project architect usually prepares the program.

After verifying programmatic requirements, the firm works with the school to begin defining system components, locations, quantities and budget. The firm incorporates that information into the Schematic Design report, which provides a general outline for the technology systems and preliminary cost estimates. The Schematic Design phase usually takes about three months, depending on the scope of the project.

### 2. Design Development

The primary purpose of Design Development is to elaborate on the Schematic Design report and provide a greater level of detail. Before beginning Design Development, it is important that all key stakeholders at the school provide feedback on the Schematic Design report. It is particularly important to verify the budget and the types of technologies outlined.

After receiving the school's input, the technology consultant prepares

the Design Development document. This document provides more detailed product specifications (including specific makes, models and quantities) and cost estimates. The firm also delivers infrastructure markups detailing requirements for the proposed technology systems, such as locations for electrical outlets, and network and cable TV hookups. At the end of this phase, which usually lasts about six months, the school reviews the Design Development document and provides a written response indicating acceptance or non-acceptance of what was outlined.

### **3. Construction Documents**

The goal of the Construction Documents phase is to prepare a comprehensive set of documents that will result in accurate, on-budget bid responses from contractors. Construction Documents build upon the Design Development document and finalize product specifications and cost estimates for each technology component.

In essence, the Construction Documents outline exactly what the school will be writing a check for when the project is awarded to a contractor. To that end, it is important to verify that the funds have been appropriated for the technology systems, that everyone is aware of what they are getting for those funds, and that priorities have been established for how the systems will be used.

Construction Documents usually have two milestone review periods wherein the technology consultant will submit a "50 percent document" and a "95 percent document" to the school for approval. The "50

percent document" is actually a completed set of Construction Documents, however, it is considered only 50 percent complete because the school has not yet responded to it. The "95 percent document" reflects the school's responses as well as any updates.

When a final consensus has been reached, the Construction Documents are published and distributed to contractors. The entire Construction Document phase usually takes six to eight months.

### **4. Bidding and Negotiations**

After collecting contractors' bids, the school delivers them to the technology design firm. The firm analyzes each bid, outlines any deviations among bids, and submits a report to the school for evaluation. In addition, the school may evaluate contractors on such criteria as qualifications, experience, financial history, bondability, and distance from the campus. At the end of this phase, which usually lasts only 30 days, the school will select a contractor, negotiate fees, and award the project.

### **5. Construction Administration**

During Construction Administration, the technology design firm manages the procurement and installation of the technology systems. As such, the firm's primary "deliverable" is time. When the contractor comes on board, questions and issues are bound to arise. What if a technology component becomes unavailable? What if a new model is introduced that is better and cheaper than the model specified in the Construction

Documents? The firm coordinates with the school and the contractor to find the best solution.

After the contractor has installed the technology systems, the technology design firm oversees systems integration. After all, it is the firm's job to ensure the successful operation of the systems it designed.

After systems integration has been successfully completed, the contractor will provide the school with a package of "as built" documentation to show how the systems have been installed. Depending on the size and scope of the project, Construction Administration can last nine months to two years.

### **Designing for the Future**

Thanks to the nation's robust economy, higher education is booming with building construction and renovation projects. For many schools, technology design is now a key consideration in those projects. With careful planning and collaboration, schools can successfully implement new and emerging technologies to enhance teaching and learning for many years to come.

*Paul Corraine has more than 11 years of experience in the audiovisual communications industry. His firm, Convergent Technologies Design Group, provides master technology planning, data network design, telecommunications cabling, and audiovisual and acoustics design for higher education institutions nationwide. For more information about CTDG, visit [www.ctdginc.com](http://www.ctdginc.com) or call 410-532-2395.*