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An architect explains the various planning steps necessary to create new spaces on campuses and reflects on characteristics of working relationships that are most effective in creating informed learning spaces.

Educator and Architect Partnerships for Success

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We've all experienced powerful environments that stimulate us physically, emotionally, and intellectually. It is easy to look at past masterpieces and think of the architectural creative genius. Creating architecture is a collaborative process involving architects, engineers, builders, financiers, facilities managers, and users. This collaboration resolves diverse requirements for budget, schedule, planning, zoning, codes, design vision, technical building details, mechanical and electrical performance, construction methodology, and building function. When the collaboration works well, buildings function efficiently, are affordable, contribute to our communities, and provide inspiring environments.

This collaboration has not reached its full potential in education—educators are important contributors but have not been as actively involved in the past and are novices to the process. When the ultimate users do not contribute and provide leadership, the architectural solution cannot be fully effective. This has never been as true as today in the midst of educational revolution. As education changes, so must the architecture that supports it. The architect can only understand this constantly evolving change through thoughtful interaction with educators.

This chapter explores the planning process and key considerations to a successful architectural collaboration. While the subject matter is too large to fully cover, this chapter provides a knowledge framework for educators to develop as they plan their facilities. It explores the planning participants, traditional planning process, and suggested changes in the planning process.

Planning Participants

Of all the planning participants in a successful architectural project, three constituents are essential to a successful collaboration. Each has tremendous responsibilities to the team for communication, consensus building, and decision making. Each must make a personal commitment to the project and accept associated risks. These people are the primary user representative, the architect, and the facilities manager.

User Representative. The user representative is responsible for representing the extended user group, which includes students, administrators, faculty, and staff. This person must not only make sure that communication flows in both directions but that users actively contribute ideas, thoroughly evaluate information, and honestly express their opinions. The user representative should challenge the work and be an advocate for the internal functions of the building—explaining to the architect why user concerns are valid and explaining to the users why project constraints are real. More than anyone else, the user representative is the link between the design team and the occupants of the building. Good people and leadership skills are essential.

Architect. The architect represents the design team, which can number hundreds of professionals on large projects. Staff can include planners, architects, interior designers, cost estimators, construction administrators, and engineers for soils, structural, plumbing, mechanical, electrical, and technology systems. The primary architectural representative must work on several levels, from design visionary to technical detailer, from contract manager to consensus builder, and from engineering coordinator to cost estimator. Architects are artists who are willing to spend countless hours improving their designs. But architects must also be business professionals. They must manage consulting fees, control their risks, hold planning participants and contractors accountable, and inform clients when ideas are unrealistic. Architects are expected to design buildings that function well, protect public life and safety, withstand wear and tear, and are affordable and beautiful. Unlike manufactured products, buildings are expected to function perfectly upon completion, without the benefit of testing. Architects are therefore at risk from flawed details and unrealistic client expectations.

Facilities manager. The facilities manager manages the operational needs of the campus physical plant and promotes campus development. This person coordinates the efforts of campus planners, finance administrators, public safety officers, and managers for traffic, parking, utility infrastructure, campus grounds, and environmental health and safety. Facilities managers are liaisons between these various offices and academicians. They are responsible for implementing and conforming to institutionally adopted standards including master plans, project programming, design standards and community agreements. Facilities managers are responsible for managing the

design process, specifically budgets, schedules, space allocation, quality expectations, and institutional risks. Because buildings are unique designs requiring millions of dollars, there is the constant risk of claims and lawsuits. The facilities manager must resolve such issues fairly and equitably. This part of architectural creation isn't glamorous, but it is as important as any other element.

Project Delivery Process

Architectural projects are typically conceived and implemented in six phases: programming, schematic design, design development, construction documents, bidding, and construction. Programming is the concept phase that describes intent. From this, owners make the go/no-go decision. Schematic design, design development, and construction documents compose a three-step process that begins with sketch studies and concludes with detailed technical documents. Each phase is more detailed and technical than the preceding one. The owner reviews, comments, and approves the design after each phase. Bidding is a transitional phase during which the design is put out for bid and construction contractors are awarded the work. Construction is the final phase, during which contractors have primary leadership responsibilities. The building is constructed, furniture and equipment is installed, and the user moves in. The following describes each phase in more detail.

Programming. The programming effort describes the requirements of the physical design in detail and results in a report called a "Program of Requirements." It states the owner's needs: activities to be housed, intended functions, vision statement, project goals, academic challenges, and development opportunities. The report establishes the development parameters of the project: building location, budget, schedule, and approval authority, and it describes space requirements by area allocation and room adjacencies. Detailed requirements for each space, building system, and site considerations are further articulated with words, data, diagrams, and photographs. The report typically describes the solution with words because the concept affects the programmatic results. However, the solution should not be designed at this phase so as to constrain the architect's creativity. This is an important and unconstrained opportunity for users to clearly communicate their expectations and needs with the design professionals prior to design decision making.

Schematic Design. Schematics is an interactive process between the design team and owner through which the optimum solution is created. The result is a site plan, floor plans, building sections, and exterior building elevations. The design is further described in outline specifications that describe building construction and mechanical and electrical systems. The construction cost is analyzed in further detail and necessary adjustments are made.

Design Development. During the design development phase, specific details of the construction are articulated, and all decisions for which the owner should have input are typically agreed upon.

Construction Documents. Preparation of the construction documents is the third and final design phase, during which the design team describes the conditions of the construction contracts in detail. Drawings are created for every construction trade. Detailed specifications are further developed, general conditions of the contract are described, and a final detailed estimate of cost is prepared.

Bidding. During the bidding phase, construction documents are distributed to prospective construction contractors for their use in preparing construction bids. Documents typically include technical drawings, written specifications for building materials and their installation, and legal contractual requirements to complete the work. The architect responds to bidders' questions and issues legally binding clarification documents called *addenda*. Bids are received, opened, and tabulated. The owner and architect evaluate the bids and the bidder's ability to perform. Preferred contractors are selected and contracts executed.

Construction. Contractors lead all construction activities and coordination between the trades. During this time, the architect administers the construction contracts. This includes observing the work for conformance with the construction documents, clarifying the intent of the construction documents, reviewing shop drawings, reviewing contractor applications for payment, responding to needed changes of the work, and documenting the progress of the work.

Overview of the Process. The project delivery process, from programming through construction, has several checkpoints to protect participants' interests. The user group has approval authority after programming to confirm that its needs have been completely and clearly documented. The user group has approval authority after each design phase to confirm that the design meets the program objectives. The facilities manager has approval authority after each programming and design phase to confirm the project is meeting budgetary and institutional development goals. The architect receives formal approvals of decisions upon which to base subsequent work. This process provides control, accountability, and efficiency.

The project delivery process develops from general ideas to specific details. The user group's input should be concentrated in the early phases. Design decisions requiring user group input should be completed by the end of the design development phase. Decisions made in the program, schematic, and design development phases have the greatest impact on design quality and budget conformance. By not understanding the process and their responsibilities, the users can unknowingly forfeit their input. Modifying decisions in later phases is tremendously challenging and expensive. The schedule can be jeopardized, commitments can be compromised, and the architect loses profitability.

In the absence of thoughtful user input, the facilities manager and architect are likely to base their work on past model solutions. For example, an educational facility can be a classroom building with a series of thirty-foot-square classrooms flanking each side of a corridor. Although this may have fit prevailing beliefs about appropriate pedagogy forty years ago, it won't necessarily work tomorrow. The influence of pedagogical shifts, technology integration, curriculum development, and the need for lifelong learning changes everything.

New environmental models will develop that haven't been conceived yet. Fundamental questions need to be asked that once were taken for granted. Who will be our students? How will we conduct class? How long will classes last? Should different functions be separated or fused? How much space should be allocated and shared? Who controls the space? How is student recruitment and retention being addressed? Will the new concept cost the same per square foot? Will the new concept require the same maintenance and energy costs? These questions are difficult to answer during a period of shifting paradigms, and will be even more difficult to predict for the next forty years. Yet these questions need to be answered by the planning participants in the context of use, design, and facilities management.

Suggestions for Enhancing Design Collaboration

To facilities managers and architects, the traditional project delivery process is fundamentally sound and well understood, but it is not ideal for the challenges faced today. In today's educational environment, the planning process should be more collaborative with educators because educators are on the front lines of attempting to focus on student learning. Collaboration should take place early in the project because it is during this period that user input is critical—how have space needs changed as we refocus our efforts from teaching to learning outcomes? The following suggestions are offered to enhance the personal relationship of the planning participants and thus, the effectiveness of their collaboration.

Designing a building typically becomes a personal mission for those directly involved because the result is a physical legacy that will have an impact on its community for generations. The design process is enhanced by personal relationships—mutual trust, shared commitments, and open communication. Understanding each other's individual interests is the foundation of a personal relationship. It is important for the participants to take time getting to know one another and to develop this relationship prior to commencing design. All participants should be realistic and open-minded during times of difficulties. Experimentation sometimes results in setbacks, and the team members have to trust one another to work through failed solutions to arrive at innovative ones.

Developing the project committee and clearly defining responsibilities and authority for each member are crucial for success. It is important to

consider committee levels, that is, primary members and support members. Committee member ownership of the process is critical. They must be committed to the success of the project as well as be advocates for their constituency. The whole committee must understand that compromises will be made and that the committee members are responsible for shaping the best solution. All should rely on the individuals of the committee and design team staff. The primary representatives must focus on communication and team building, not micromanaging every detail.

Expanding the schedule of the project can allocate more time to programming and schematic design for careful consideration of issues and alternatives. Too often architects are hired with a time frame that demands immediate commencement of design, which bypasses important early conversation and team building. This schedule is often the result of not wanting to hire an architect until funding is in place. It is important to allocate funds for programming prior to design and construction. Allow time to fully develop the program for a limited financial risk.

Allocating time prior to formal programming to develop a shared understanding is valuable. Visit users' facilities and benchmarked programs at peer institutions. Review the design process and the importance of each step. Seek to frame the key questions without the pressure of answering them. Architecture is an educational process; treat it as such.

Hiring outside consultants to develop your program of requirements can bring fresh ideas to the institution, challenge old assumptions, and facilitate orderly decision-making.

Prior to hiring the architect, collaborate with the facilities manager to write the request for proposal for architectural services. When you buy a car, you start with a good idea of what's available and of the type and features you want. Yet many people select an architect without understanding the differences between firms or the services they offer. Campus facilities managers understand these differences and should consult with user representatives prior to requesting qualifications.

Some architectural firms have a general practice, serving all the needs of their client base. These firms can team with specialty firms, which are expert at design and aesthetics or specific project types. Some specialty firms also contract directly with institutions and can provide full services. They are often out-of-town firms that have developed their operations to practice across long distances. However, they have difficulty being as responsive as in-town firms are during the construction documents, bidding, and construction phases.

Firms that specialize in learning environments understand the issues facing educators. They have experience in understanding the nuances of specific programs and can more readily interpret them into new concepts. Trust and consensus are built earlier in the design process.

Architectural firms offer a wide array of services. The American Institute of Architects (AIA) has developed standard agreements that are

understood in the industry. Many institutions have standard agreements modeled after AIA agreements. They define the services and performance of the parties. Generally, architectural services are described as basic and additional. Basic are the minimum services to design, bid, and administer construction. They exclude programming, exhaustive studies, renderings, models, and full-time construction representation. These services are just a few of the additional services architects can provide. The more comprehensive the services negotiated, the more responsive the architect can be to the user's needs. More fees are required with more services, which takes away from capital improvements. The fee spent to expand services during programming and schematic design is important in defining viable solutions for tomorrow's learning environments.

The architect should have an appreciation for the educational change occurring and have a desire to develop a thorough understanding of the user's activities and needs before commencing design. The architect should recognize that the building is being designed for how learning will occur in the future, not how it has been constrained by past philosophies and building design. Developing this understanding requires time and exploratory conversation. This is the opportunity for educators to contribute expertise by explaining learning processes and identifying educational challenges.

User representatives should embrace the contractual relationship between the architect and institution. The architect has legal obligations to perform, all of which require time and money. Large fees negotiated with architects often yield 5 percent profit or less. Excessive effort spent in any one area limits the architect's effectiveness in other tasks. Often the user group isn't involved with the architectural contract, even though it dictates what services will be provided.

Users should be encouraged to participate in the negotiation process for architectural services. Understand what services are available, and what the cost and value is. Help select those services that will benefit the project. Besides the extra services mentioned in connection with the basic agreement (programming, exhaustive studies, renderings, models, and full-time construction representation) architects can also provide benchmarking trips, specialty design expertise, community presentations, and procurement of furnishings and technology.

Users should also be encouraged to participate in developing the work plan. Understand when decisions need to be made and communicate what is necessary for the users to make such decisions.

Establish a shared vocabulary with the facilities managers and architects. Words are powerful but can mean different things to different people. A *learning environment* to an educator could be the people and technology, but to an architect the term means bricks and mortar.

Architectural terminology can be intimidating to anyone not in the business. This is particularly threatening to educators, who are used to being the holders of knowledge. The same observation is true for educational

terminology and its effect on architects who specialize in educational facilities. Planning participants should feel comfortable enough in their relationship to say, "*I don't understand.*" The consequence of not expressing confusion is design development based on misinformation.

Everyday terminology establishes mental pictures that we often don't question. For example, a classroom has come to be thought of as the place where education occurs. It is a thirty-foot square room with rows of desks and an instructor in front. Developing new names causes planning participants to challenge solutions and to see spaces in a different light. How might a studio be configured to house mathematics classes?

Architects think graphically. When communicating with architects, it might be helpful to use videos, photographs, and sketches to discuss your functions or ideas you've come across in other buildings. Storyboards and picture books can help create collages of thoughts. Use all means available to supplement your description of what you want to be able to do, but don't fall into the trap of trying to design the solution. The user responsibility is to define need and evaluate if the architect's solution will work.

Learn how to work effectively with architects and facilities managers before commencing large and complex projects. Start with a simpler project such as a classroom renovation, where the stakes are relatively low. The tasks are practically the same as for a new building. The primary difference is the number of people on the team. By completing such a project, the user representative is able to create a how-to guide. This enables the user representative to refine the process and to counsel members of the larger committee in fulfilling their responsibilities.

Approach your building as an experiment. Buildings are often designed for one group of individuals but used by different people. Retirement, career moves, and the building life cycle all contribute. To think every detail will be perfect for forty years is unrealistic. The building must adapt as well as the users.

In facilitating the transformation to learning-centeredness, the details alone don't define success. What do are the program concept, spatial environment, design character, and building flexibility. New solutions for these concerns will emerge through experimentation and evaluation. Each new solution will enable educators to do things unimaginable today, which will cause a reaction by the building, which will cause the next round of evolution. In each phase of this evolution, there will be successes and failures, but learning will always occur. Constant modifications to a building will probably be a marker for educational success.

It is wise to seek a partnership with the facilities manager and architect to periodically evaluate building performance and to make recommendations for short-term solutions. Applying these lessons to future improvements in the building and to new projects across campus is imperative to campus learning.

You can find interesting concept solutions outside of academic designs. For example, retail and residential buildings offer ideas for social interaction

areas. Experimenting on paper and in existing facilities with translating these ideas to facilitate learning and maintaining ongoing dialogue with your architect and facilities manager are useful activities in driving continuous learning.

Function and budget should guide all decisions. The form wants to follow the function, so if the function is radically different, so will be the form. The best solution may not look like a traditional academic building in appearance, materials, or construction. A new idea that challenges today's standard sometimes becomes tomorrow's standard. The architectural solution must be more than a concept. It must be developed so it stands the test of time. The collaborative relationship of team members must be strong enough to allow them to thoroughly challenge each other, to demand the design will work in all aspects.

Strive to exhilarate people. Thousands, if not millions, of decisions are made in the course of an architectural project. Most of them are mundane and spread out over years. Projects can become drudgery if people aren't inspired. It helps to set a bold vision that challenges people every day to perform above their capabilities.

Responding to people's emotions is part of an effective process. The user groups should be challenging themselves to create the benchmark learning environment. The architects should be challenging themselves to create powerful physical environments and to create art through architecture. Together, the efforts of all should be focused on creating a masterpiece that will be admired for generations.

An important step is to define the outcome of the project, and by doing so define the essence of success. Thinking without constraints can clarify the big picture. Seeking input from all concerned parties is imperative for success, but it is important to recognize that the project won't be able to accommodate all interests. In the end, the vision must be bold, clear, and represent a voice of the leadership. The solution will be bold, clear, and an artistic statement of the architect's interpretation of the project's vision, discerned from the voices of the user groups.

Embrace the concept of modeling results in honest dialogue and open-mindedness. We all have vocabularies that are powerful to us but have little meaning to others. Visualization of concepts creates understanding, and alternative concepts place higher priorities on different project elements. The debate to determine the preferred solution resolves conflict and invariably ends in the creation of a new concept that meets the project's criteria for success.

Creating architecture creates professional and financial risks. Typically, the more innovative solutions have more risks. Many people don't care to acknowledge or deal with this, which can cause planning participants to become untrusting and divided.

A safe and traditional architectural solution may not facilitate educational evolution, and it will certainly constrain the next generation of educators. The most appropriate architectural solution may be very unusual for

a campus, thus open to criticism. An innovative solution may not initially function completely as intended, thus requiring additional work to perfect. This can be viewed either as a failure or as research and development for the institution.

The users are at risk of receiving a building that doesn't meet their future needs. The facilities manager is at risk of a project that requires unavailable time and money to modify. And the architect is at financial risk in developing innovative solutions for traditional fees. The user representative, facilities manager, and architect should encourage each other to jointly manage their risks through open communication, consensus building, testing of ideas, and work plan management. Take sufficient time in early phases to fully explore ideas.

The user representative should be encouraged to research the institution's adopted design guidelines and consult with the facilities manager and architect as to their interpretation. These guidelines may include a campus master plan, a technology master plan, and space management standards, design standards, and standard details and specifications. These guidelines can dictate design decisions as well as make accommodations for specific project requirements. The planning participants should discuss the reasons behind such standards and jointly decide when to deviate from them.

Conclusion

Collaboration requires a commitment from each of the primary partners to one another's mutual success and to a shared definition of project success. Collaboration is based on personal relationships, not contractual responsibility. These relationships need to be developed early in the programming process where key irreversible decisions are made. This investment of time and energy will pay off with saved efforts in later phases and solutions that meet the educator's requirements.

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