

Industrial Experience: The Role It Plays at the University of Hartford AET Program

**Daniel Davis, AIA
University of Hartford**

Abstract

The University of Hartford's Architectural Engineering Technology (AET) Program curriculum is based on the blending of academic-based theoretical studies with industry-based problem solving activities. Integral to accomplishing our educational goals is having the participation of industry in the educational process. It is extremely beneficial to have practitioners in the classroom on a daily basis. This practitioner involvement comes from both our full-time and part-time faculty.

The goal for educators and practitioners should be a unified profession. The time has come for educators and practitioners to put aside their differences and join in a common purpose: that of preparing people for their profession. Our approach takes steps to create avenues for more open, sustained dialogue, and fully acknowledges the shared goals and responsibilities of educators and practitioners. We are attempting to redefine the boundaries between education and practice, while building mutual respect and an integrated model.

According to Dr. Ernest L. Boyer, this century's great educational leader, "the future belongs to the integrator", and it is through the integration of industrial experience that we have developed the AET Program at the University of Hartford.

History Repeats Itself

In 1865, eight years after the founding of the American Institute of Architects (AIA), Massachusetts Institute of Technology offered the first formal, campus-based architecture courses in the United States.¹

An early history of architectural education by Arthur Clason Weatherhead noted that the typical curriculum in the early twentieth century lacked cohesiveness. For example, the business side of architecture was neglected, and little effort was made to aid in the transition of students from the academy to the office.²

Years later, 'A Study of Architectural Schools: 1929-1932', sponsored by the Association of Collegiate Schools of Architecture (ACSA) and funded by the Carnegie Corporation, criticized the dominance of design faculty over those specializing in 'construction.' Design projects at many schools, it said, resulted in 'paper architecture' whose real purpose and function was often unclear and unrealistic.³

In 1954, almost twenty-five years later, an AIA commission produced a two-volume report: “The Architect at Mid-Century”. Preparing for the second half of the twentieth century, the report encouraged educators and practitioners to close the developing gap between them. The report said that faculty will do well to maintain the closest possible relationship with the profession in order to adjust content and method to the changing needs of practice.

A decade later, the AIA sponsored the 1967 ‘Study of Education for Environmental Design’. Widely referred to as the ‘Princeton Report,’ this study is a frequently cited but often misconstrued. However, the study does stress the importance of ending the isolation of the architectural discipline. It called for making connections – ‘building ladders and bridges’, again, closing the gap between the schools and the profession.

Building Community: A New Future for Architectural Education and Practice (The Boyer/Mitgang Report) by Ernest L. Boyer and Lee D. Mitgang of the Carnegie Foundation for the Advancement of Teaching, 1996, was intended to be a “comprehensive study of education and practice for the 21st century.” The Boyer/Mitgang Report proposed as their first and foremost goal an enriched mission, one which effectively connects the schools and the profession. They also call for a connected curriculum that encourages integration, a supportive climate for learning, a more productive partnership between schools and the profession. These concerns, while more clearly stated here than in other studies, are clearly not new.

It has been noted that the current school curriculum at many architectural programs actually conveys a smaller percentage of the total knowledge and skill required for practice than in any period during the 131 years since professional programs were established.⁴

The voices of many recognized and respected members of the architecture profession echo this often-repeated message:⁵

- Robert Frasca of Zimmer Gunsul Frasca Partnership: “If more academics would build and more professionals would teach, everyone would benefit.”
- Harold Adams of RTKL: “Architecture education is too detached from the world of practice. Students need a better understanding of what’s really required to succeed as architects and be leaders in today’s global economy.”
- Michael E. Willis of Michael Willis and Associates: “Architects should get themselves involved in the development of architecture school curricula.”
- Adele Naude Santos of Adele N. Santos and Associates: “One of the Achilles’ heels of architecture education continues to be the lack of integration of technical subjects with design studios, despite the fact that this fusion is essential to architectural education.”

The AET Program at the University of Hartford⁶

The University of Hartford is a private, independent, comprehensive university located four miles from downtown Hartford. The Architectural Engineering Technology (AET) program offers a four year pre-architecture degree and is accredited by the Technology Accreditation Commission (TAC) of the Accreditation Board for Engineering and Technology (ABET). In

Connecticut and most states in the United States a professional architectural degree is required as a prerequisite for licensure. Many prospective architects attend five-year undergraduate programs (first professional degree programs) in architecture. Our students prefer the four-year pre-architecture program followed by a two year Masters degree in architecture. The two-year M. Arch is considered the professional degree and meets licensing requirements. (A third route is a four-year general education degree followed by a 3.5 year M. Arch program) Following completion of a professional degree program a prospective architect must complete a minimum of three years internship in the Intern Development Program (IDP). After successfully completing the IDP program candidates are eligible to sit for the nine (9) part national Architecture Registration Exam (ARE).

The AET program at the University of Hartford began in 1991 - 1992 with only 6 students. The program has grown to close to 100 students. Its mission is “to prepare students for a variety of professional careers in the design and building industries”.

The AET program’s goals are to:

- provide a proper foundation in mathematics and the basic sciences.
- retain the hands-on laboratory and studio features that are the hallmarks of all engineering technologies.
- provide a broadly based education that will go beyond the bounds of technical competence.
- enhance the graduates’ capacity for upward mobility within and beyond the profession.

The objectives of the AET program are to provide students with the opportunity to develop technical and professional competence, reasoning skills, communication and problem solving skills, the ability to work cooperatively and an understanding of the ethical and economic issues associated with the application of technology in contemporary society.

Connected Curriculum – A More Integrated Profession

As The Boyer/Mitgang Report and the other studies suggest, architectural education should be connected to industry and reflect the conditions of practice. Boyer often said “that architecture, which involves so centrally the integration of many disciplines through the design act, deeply intrigued him.”⁷ However, at many schools, those with integrated, well-balanced careers in teaching and practice are becoming increasingly rare.⁸

Our integrated and genuine teacher-practitioner philosophy combines scholarly productivity and teaching excellence with professional experience and accomplishment. Remarkably, less than half the nation’s full-time and part-time architecture faculty, some 48%, are licensed architects, according to data from the National Architectural Accrediting Board.⁹ At the University of Hartford’s Ward College of Technology 100% of the full-time faculty members are registered architects and 80 percent of the part-time architecture faculty are registered architects or professional engineers. On a course by course basis, 91 percent of our courses are taught by either registered architects or professional engineers, all of which have current industrial

experience. Typically, our unlicensed professionals will have a Ph.D. or another advanced degree in their specialty.

Chart A – Professional Credentials of Full-time and Part-time Faculty

Type of Faculty	Registered Architect	Professional Engineer	Unlicensed
Full-time Faculty (4)	4	0	0
Part-time Faculty (10)	5	3	2
33 Courses Fall98/Spring99	27 (82%)	3 (9%)	3 (9%)

Because most of our full-time and part-time faculty work or consult with local architectural/engineering firms strong connections to industry have developed.

Educators and practitioners should help establish a more unified profession; one based on a new, more productive partnership between schools and the profession. The priorities for sustained action between the academy and the profession should include the strengthening the educational experience of students during school, creating a more satisfying system of internship after graduation, and extending learning throughout professional life.¹⁰

The new alliance or partnership between architects and educators should begin with enriching the daily activities and the curriculum of schools themselves. By involving practicing architects more often in studios and classrooms, and on committees that deliberate about and establish curriculum and school missions, a sense of shared purpose will develop. This relationship would be based on strengthening the profession and meeting the needs of future architects.

The challenge of working on industrial problems (and projects) and in close contact with architects and engineers, who (themselves) are concurrently working on the same or similar problems (and projects), provides valuable experience which can ease the post-graduate transition from student to employee.¹¹

The University of Hartford's Ward College AET revised curriculum:

- Design is introduced early in the program and integrated throughout the curriculum.
- Increased exposure to practice is provided through industry-in-the-classroom activities.
- Increased emphasis is placed on communication, both oral and written, again with requirements integrated throughout the curriculum.

We also offer some more precisely focused studios such as the institutional, commercial and urban design studios. These studios involve students in current real-world projects encouraging them to explore their ideas in a more detailed fashion, with the participation of experienced expert practitioners.¹² We hope to offer more of these kinds of studios, such as a construction, design-build, and a technology studio. Studio sponsorship would also be another effective collaborative model to consider.

Third year students participate in a ‘mock interview day’ designed to help students experience and understand the interview process; get feedback on their resumes and portfolios; and practice their communication skills in an interview setting.

The schools should investigate and test ways that curriculum can effectively respond to the changing conditions of architectural practice. Students who work in studios with active professionals would also get exposure to an expanded view of the architectural process, from pre-design through post-construction.

Business and accrediting agencies (should increase) the pressure on architecture and engineering programs to integrate job-related skills into undergraduate curriculum.¹³ Academic institutions, when considering faculty for tenure, should also weigh the time spent in the active practice of architecture as scholarship worthy of merit.¹⁴ The tenure review process is forcing faculty to specialize, resulting in a faculty group of specialists who are more focused than you will find in most architectural or engineering offices.

Results suggest that efforts to enhance the value of teaching in AET programs cannot be addressed solely through efforts to reform the attitudes of existing faculty. Instead, adding experience in industry as an important criteria in the hiring new faculty and the awarding of tenure to existing faculty with industrial experience may be fundamental to changing the existing culture. These efforts would also place a greater emphasis on teaching, for studies have shown that industrially active teachers typically spend a greater percentage of their time on teaching above and beyond their work assignments¹⁵.

Everyone Benefits – AET Programs and Industrial Partners

Our industrial partners contribute in many ways, providing physical and personnel resources including¹⁶:

- Student design project and course theme ideas;
- Practicing architects in the classroom or studio;
- Helping us to replace the ‘architect as hero’ model with the ‘architect as team player’ model;
- Donations and loans of equipment and technology;
- Direct financial support;
- Summer internship and employment opportunities for our students;
- Tours of office facilities for students and faculty;
- Tours of construction projects for students and faculty;
- Assistance with course development;
- Assistance with program development and mission;
- Strategic guidance in matters of fund-raising, accreditation and management.

In order to be successful, this partnership must be mutually beneficial to academia and industry. Our industry collaborates directly benefit from this association by¹⁷:

- Increased availability of well-prepared AET graduates who understand the design and documentation process;

- Opportunities to evaluate potential employees through internship, summer employment, collaborative projects, and classroom interaction;
- Direct assistance in project research and design through mentorship of senior design thesis projects;
- Professional development of industry personnel through teaching, curriculum development and continuing education;
- Technology transfer through industry-academic exchanges;
- Helping practitioners understand what faculty must do to survive in the university setting;
- Opportunity to influence and improve the education of the architects of the next century.

The members of our industrial team run the spectrum from large national architecture and engineering firms to small sole-practitioner offices and all appear to benefit from this relationship.

Conclusion

At the University of Hartford's AET program, we have experienced both the opportunities and challenges that come with starting any new program at a university. The research and evaluation provided by The Boyer/Mitgang Report and others who promote industrial experience have been valuable to the architectural community at large but especially to us as we work to develop a meaningful architectural educational experience for our students. We will continue to strive to meet the challenges of incorporating industrial experience into an AET program. We are attempting to redefine the boundaries between education and practice and we look forward to continuing this dialogue with students, graduates, practitioners, faculty, and administrators.

Bibliography/References

- ¹ Boyer, E.L. and Mitgang, L.D., *Building Community A New Future for Architectural Education and Practice*, (The Carnegie Foundation for the Advancement of Teaching, 1996), p. 14.
- ² Ibid., p. 16.
- ³ Ibid., p. 20.
- ⁴ Gutman, R., "Redesigning Architecture Schools", *Architecture Magazine* (August 1996), p.88.
- ⁵ Ibid., pp. 90 – 91.
- ⁶ Davis, D. and Petry, E., *Integrating the Boyer Report into Architectural Education at the University of Hartford*, (ASCE/JPI Manuscript, 1999).
- ⁷ Boyer, E.L. and Mitgang,L.D., *Building Community A New Future for Architectural Education and Practice*, (The Carnegie Foundation for the Advancement of Teaching, 1996), p. xiii.
- ⁸ Ibid., p 51.
- ⁹ Ibid., p 51.
- ¹⁰ Ibid., pp. 27 – 28.
- ¹¹ Incropera, F.P. and Fox, R., "Revising a Mechanical Engineering Curriculum: The Implementation Process", *Journal of Engineering Education* (July 1996), pp. 233 - 237.
- ¹² AIA Practice Education Summit, Lawrence Kansas, April 4 – 5, 1997.
- ¹³ Sullivan, F.J. and Baren, R., "Simulating the Workplace in an Engineering Technology Course: A Rhetorical Model", *Journal of Engineering Educators* (July 1997), pp. 279 – 283.
- ¹⁴ Ivy, R., "Carnegie Study Sets Goals for Educating Architects: Calls for Renewal", *Architectural Record* (May 1966), pp. 22 and 28.

¹⁵ Fairweather, J. and Paulson, K., “Industrial Experience: Its role in Faculty Commitment to Teaching”, *Journal of Engineering Education* (July 1996), pp. 209-215.

¹⁶ Lamancusa, J.S., Jorgensen, J.E., and Zayas-Castro, J.L., “The Learning Factory-A New Approach to Integrating Design and Manufacturing into the Engineering Curriculum”, *Journal of Engineering Education* (August 1997), p 108.

¹⁷ *Ibid.*, p 108.

DANIEL DAVIS, AIA

Daniel Davis is an Assistant Professor of Architectural Engineering Technology at the University of Hartford's Ward College of Technology. He has more than 18 years of experience as a Design Architect and many of his projects have been published in professional journals and/or won design awards. Davis holds degrees from Catholic University and Pratt Institute. He is also an associate with Friar Associates, Inc. of Farmington, CT.