AC 2008-1688: FACULTY COLLABORATION ON DOCUMENTING OUR NEW SCHOOL OF ARCHITECTURE

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Faculty Collaboration on Documenting Our New School of Architecture

Abstract

What happens when the opportunity arises to use the expansion and renovation of one's own School of Architecture as a teaching tool? The School of Architecture was recently awarded a 14.8 million dollar grant for the expansion and renovation of our current facility. The two year schedule for construction of the building was preceded by several years of applying for the grant and working through conceptual and preliminary design. In using the project as an educational tool, many topics could be included such as architectural, structural and HVAC design; budgeting and construction issues, and management of the project. Each of these topics, along with many others, could potentially be used as real life examples of the process of architecture, engineering and construction. The question is how to go about deciding the limits of what could or should be used in the classroom, and determining how to go about documenting the process at this time. This paper will look at the collaborative process of planning for the use of the project as a teaching tool, and arrive at a decision on the material that will be documented to be utilized in using the expansion and renovation of the School of Architecture as an educational experience for our students.

Introduction

With an enrollment of 22,000 students, the main campus of Oklahoma State University includes the School of Architecture as part of the College of Engineering, Architecture and Technology. The focus of the school is to educate students who will be leaders in the professions of Architecture and Architectural Engineering. Both the National Architectural Accrediting Board (NAAB) accredited Architecture degree and the Accreditation Board for Engineering and Technology (ABET) accredited Architectural Engineering degree are five year Bachelors programs. Upon graduation from this school of practice based education our students enter the professions of architecture and structural engineering as productive interns.

The School of Architecture has an enrollment of approximately 325 students along with 17 tenured and tenure track professors for the teaching of Architecture and Architectural Engineering degrees. Of these 17 faculty members, 13 teach in architectural design, history, management, and computer courses. Three faculty members teach the structural analysis and design courses, and one faculty member teaches the environmental controls and sustainable design courses. The school has a long history of graduating students well versed in the study of professional practice, and it is unique in its structure of combining the Architecture and Architectural Engineering students in common courses. This combination yields students who are particularly prepared for the integrated team approach used in professional practice. Each student in the school is required to take courses dealing with architectural, structural and environmental controls design. Combining the students into common courses has resulted in our graduates becoming leaders in the professions as they have learned to work in a team environment throughout their educational career.

In November 2005, the School of Architecture was awarded a 14.8 million dollar grant by the Donald W. Reynolds Foundation. This gift was the largest donation from a private foundation received by the University at that time, and was intended to be used in the expansion and renovation of the existing 37,000 square foot facility which had most

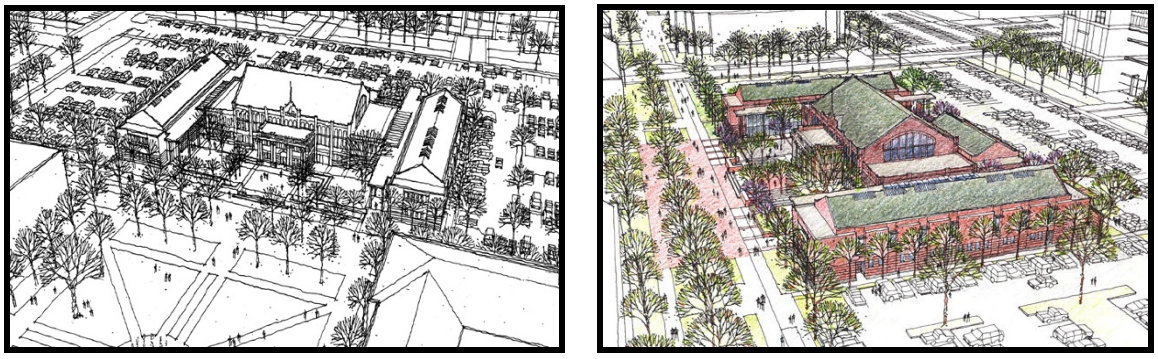

Figure 1: Renderings of the new Donald W. Reynolds School of Architecture

recently been renovated in 1977. For many years, the School of Architecture has been a substandard facility with too little space for the design studios and lacking essential facilities such as adequate classrooms and workshops. This grant will provide a building that will become a shining example of the quality of work produced by the students and faculty of this school. Upon completion, the Donald W. Reynolds School of Architecture will become a 77,000 square foot facility and will include a 200-seat auditorium, expanded gallery space and a much anticipated expanded architectural library. Also included will be new multimedia classrooms and computer labs, and the unique studio spaces within the building will be expanded to take advantage of natural day lighting

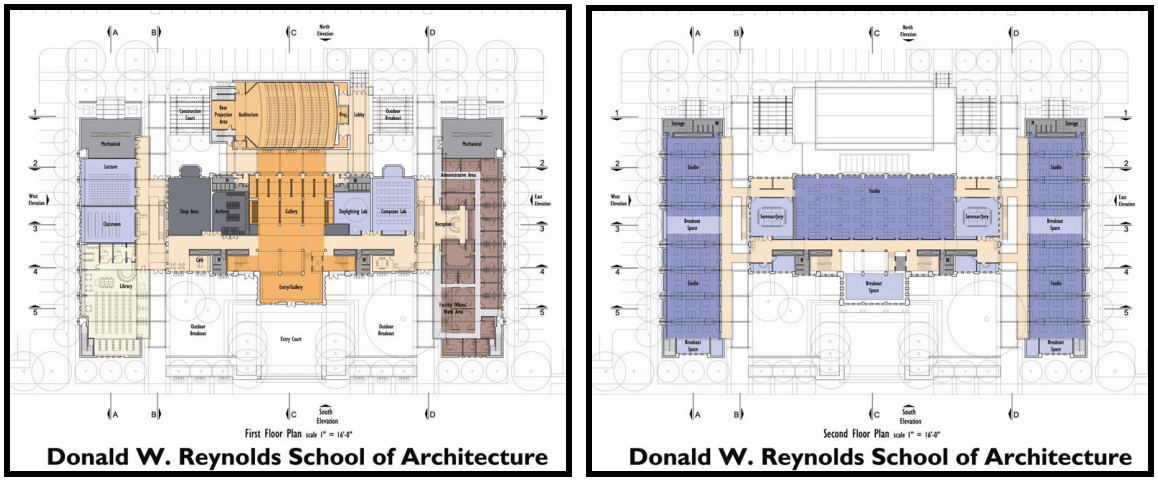

Figure 2: Schematic Design plans for the School of Architecture

conditions. Students will also have a new model shop to help in the design of their projects and the faculty will be given expanded administrative areas that will be used to better accommodate both current and future faculty.

School History

The School of Architecture was founded in 1909 as the Department of Architectural Engineering, and by 1930 offered the degrees of Architecture and Architectural

Engineering. During these early years, the School of Architecture was housed in many different locations, including beneath the football stadium seating, in Quonset huts and scattered in various building across campus. In 1977, the School of Architecture was given a permanent home on campus. Originally constructed in 1918 as the Gymnasium and Armory for the university, this two story building was renovated in the mid-1970's to accommodate the School of Architecture. During the renovation a third floor running

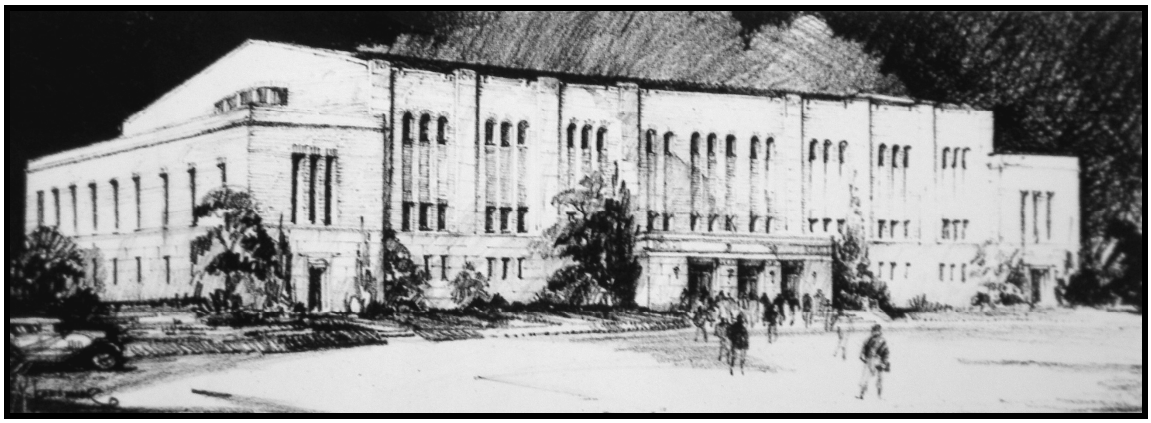

Figure 3: An early rendering of the original Armory by it's architect, Professor Redlich

track was in-filled to convert the two-story building into a full three stories to be used as studio space for the architecture students. While this new facility was far better than anything the school had been home to previously, the facilities were still greatly lacking in size and scope. Since moving into the facility in 1977, each NAAB and ABET accreditation visit has resulted in notification to the school of deficiencies in the facilities. These deficiencies were dealt with to the best of our abilities, but due to the number of students enrolled in the program, the deficiencies continued to be an issue with accreditation. In recent years the problem has increased with growth in the enrollment of our first year students. A new School of Architecture became a top priority for the University, and with much hard work the university developed a presentation for the Donald W. Reynolds Foundation that resulted in the school being awarded a grant to renovate and expand the current building.

Evaluation Process

In the design of any building, critics are going to decide for themselves whether the design is a success or failure. Schools of architecture, being centers for design, are often the focus of much criticism upon completion. "The aims, motives, processes, and performance of architectural school buildings need a candid and systematic airing. Frank exploration ... might do the architectural profession and the public a world of good."[1] It is in part due to these thoughts that we must document the design process as well as the construction of the School of Architecture. We as faculty need to be able to study decisions made in the design and construction of our new facility, and be able to disseminate this knowledge to the students of this school. There will be many questions about the design of our new building in the future and it will be to our advantage if we have a basis of knowledge by which to discuss those questions.

With the foundation award for the expansion and renovation to the School of Architecture, it became apparent that we as a school needed to document the process for

use in courses as well as for a general base of knowledge about our school's history. Little historical data remains from the renovation of the building that occurred in 1977, and the faculty wanted to make sure this will not be the case with the current construction. In addition, the construction site has the potential of becoming a classroom in itself as the construction progresses over the coming two years. The faculty wanted to make sure that in the future we would not look back and wonder why the documentation had not been performed. Immediate questions arose including what to include in the documentation process, and how to go about achieving this documentation. There are many aspects to a design and construction project, and each of the faculty have their own list of priorities as to what they would like to have documented. To further complicate the matter, the faculty will be documenting the building design and construction while at the same time teaching our regular classes and design studios. Due to the immense number of topics that could be included in the process, it became apparent that the topics

Donald W. Reynolds School of Architecture

		Circle the number that best describes your opinion of the question:				
	This survey is intended to be used for determining how to utilize the Donald W. Reynolds School of Architecture as a teaching tool during construction process and in the future. Please review the following list of oppurtunities and indicate to what extent you agree or disagree that we should:	Strongly Agree	Somewhat Agree	Neutral	Somewhat Disagree	Stornglly Disagree
1	Set up a series of site visits for students and faculty at frequent intervals (approximately every two weeks).	5	4	3	2	1
2	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***only***.	5	4	3	2	1
3	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***and*** students.	5	4	3	2	1
4	Document the sustainable aspects of the design as it pertains to LEED certification.	5	4	3	2	1
5	Document & evaluate the existing structure and how the original building was modified structurally for the 1977 renovation.	5	4	3	2	1
6	Document and evaluate the new structural systems for the expansion and how it interfaces with the existing building.	5	4	3	2	1
7	Document and evaluate the new HVAC systems to be used in the exisitng and new construction.	5	4	3	2	1
8	Document the project budget information and cost over-runs and how these are resolved (i.e., V.E. Items).	5	4	3	2	1
9	Use a stop motion camera throughout construction to document the building process of the DWR School of Architecture.	5	4	3	2	1
10	Document existing building conditions that became part of the construction process (cracks in walls, utility line relocation, ...).	5	4	3	2	1
11	Set up a library of weekly/biweekly construction site photos.	5	4	3	2	1
12	Document the construction scheduling process vs. actual construction time.	5	4	3	2	1

Donald W. Reynolds School of Architecture

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13	Document the Job site construction meetings for use in classroom settings.	5	4	3	2	1
14	Document the alterations to existing structure during the renovation process.	5	4	3	2	1
15	Document the Asbestos abatement process within the existing building.	5	4	3	2	1
16	Document the cost estimating process used by the contractor vs. actual cost of construction.	5	4	3	2	1
17	Document the schematic design team's work and the development of the project to the final design.	5	4	3	2	1
18	Document the ADA requirements included in the building design.	5	4	3	2	1
19	Develop a set of seminar presentations (.ppt) dealing with the design & construction of the DWR School of Architecture.	5	4	3	2	1
20	Document change orders and other revisions as the project progresses.	5	4	3	2	1

In the space provided below, list additional topics to be included in the documentation of the Donald W. Reynolds School of Architecture:

Figure 4: Faculty survey pertaining to areas of design & construction to be documented

to be included in the documentation would have to be limited. Major topics such as architectural, structural and HVAC design; budgeting and construction issues and management of the project are broad topics that should be included in the documentation. In addition, the structure of the original building to be renovated could be used to teach the historical aspects of structural design. But there also exist many other topics that could be included if time and resources permit. It is hopeful that the school will be able to hire students to help in the process and to utilize graduate students to help in our research, thus enhancing the number of topics and quality of the documentation.
In determining what should be included in the documentation process, informal conversations between faculty members occurred and a survey list was produced. Based

on these conversations, the survey list was used to poll the faculty on what they felt was important to be included in the documentation of the new building. The results of the survey give data that can be used as a discussion point in finalizing what will be included in the documentation process, and will allow us to determine the number of faculty that will be needed to achieve this endeavor. In evaluating the faculty's views on what to be included in the documentation, informal discussions with the faculty occurred to get a list of topics that should be considered for inclusion. From the initial list, twenty questions were placed in the form of a survey that was sent to the faculty. Each faculty member was asked to indicate which of the topics they felt warranted inclusion in the documentation process. In addition, each faculty member was given the opportunity to include additional topics they felt should be included in the process, with this becoming a second evaluator within the survey. The range of topics included in the survey was intended to cover the major categories of design and construction, with the anticipation that specialized topics might be researched and documented through the efforts of individual faculty members. *Figure 4* shows the survey as presented to the faculty.

Survey Evaluation

The results of the survey include information provided by fifteen of the seventeen faculty members. It is the opinion of this author that those who did not choose to answer the survey were either too busy to give their input or do not care to be part of the process. In

Donald W. Reynolds School of Architecture

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1	Set up a series of site visits for students and faculty at frequent intervals (approximately every two weeks).	(5)	4	3	2	1
2	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***only***.	5	4	3	(2)	1
3	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***and*** students.	(5)	4	3	2	1
4	Document the sustainable aspects of the design as it pertains to LEED certification.	5	(4)	3	2	1
5	Document & evaluate the existing structure and how the original building was modified structurally for the 1977 renovation.	5	4	(3)	2	1
6	Document and evaluate the new structural systems for the expansion and how it interfaces with the existing building.	5	4	(3)	2	1
7	Document and evaluate the new HVAC systems to be used in the exisitng and new construction.	5	(4)	3	2	1
8	Document the project budget information and cost over-runs and how these are resolved (i.e., V.E. Items).	5	4	(3)	2	1
9	Use a stop motion camera throughout construction to document the building process of the DWR School of Architecture.	(5)	4	3	2	1
10	Document existing building conditions that became part of the construction process (cracks in walls, utility line relocation, ...).	5	4	(3)	2	1
11	Set up a library of weekly/biweekly construction site photos.	5	(4)	3	2	1
12	Document the construction scheduling process vs. actual construction time.	5	(4)	3	2	1

Donald W. Reynolds School of Architecture

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	This survey is intended to be used for determining how to utilize the Donald W. Reynolds School of Architecture as a teaching tool during construction process and in the future. Please review the following list of oppurtunities and indicate to what extent you agree or disagree that we should:	**Strongly Agree**	**Somewhat Agree**	**Neutral**	**Somewhat Disagree**	**Stornglly Disagree**
13	Document the Job site construction meetings for use in classroom settings.	5	4	(3)	2	1
14	Document the alterations to existing structure during the renovation process.	5	4	(3)	2	1
15	Document the Asbestos abatement process within the existing building.	5	4	3	(2)	1
16	Document the cost estimating process used by the contractor vs. actual cost of construction.	5	(4)	3	2	1
17	Document the schematic design team's work and the development of the project to the final design.	(5)	4	3	2	1
18	Document the ADA requirements included in the building design.	(5)	4	3	2	1
19	Develop a set of seminar presentations (.ppt) dealing with the design & construction of the DWR School of Architecture.	(5)	4	3	2	1
20	Document change orders and other revisions as the project progresses.	5	(4)	3	2	1

In the space provided below, list additional topics to be included in the documentation of the Donald W. Reynolds School of Architecture:

CAN WE GET THE DESIGN TEAM (ARCH, ENGR, CONTRACTOR) TO PRESENT SEMINARS TO THE SCHOOL THROUGHOUT THE CONSTRUCTION?

Figure 5: Survey response provided by a faculty member

reviewing the surveys, some faculty members felt strongly that all of the topics warranted our attention in the documentation process (in hindsight, the survey should have been written in a way not to encourage this result). While this may be a noble gesture on their part, it would be unfeasible to expect each of the categories listed on the survey to be fully documented with the limited time and resources that will be available. This

condition led to the problem of the result values being skewed and not allowing a clear decision to be made on what to include in the process. Regardless of the skewed values, the survey still presented the topics the faculty felt should be included. Overall the response to the survey was favorably in support of the documentation process and many faculty members commented that this is indeed a cause worthy of our time and attention. It was repeatedly mentioned that the 1977 renovation of the building had not been documented in a manner that should have occurred and that little information has survived from that project. The results of the faculty survey can be seen in *Figure 6*. The surveys were based on a scale of 1 to 5, with 5 representing the faculty member strongly

Question	*Survey questions presented to faculty*	Assessment Value
1	Set up a series of site visits for students and faculty at frequent intervals (approximately every two weeks).	**4.53**
2	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***only***.	**3.43**
3	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***and*** students.	**3.68**
4	Document the sustainable aspects of the design as it pertains to LEED certification.	**3.90**
5	Document & evaluate the existing structure & how the original building was modified structurally for the 1977 renovation.	**4.21**
6	Document and evaluate the new structural systems for the expansion and how it interfaces with the existing building.	**4.70**
7	Document and evaluate the new HVAC systems to be used in the exisitng and new construction.	**4.43**
8	Document the project budget information and cost over-runs and how these are resolved (i.e., V.E. Items).	**4.39**
9	Use a stop motion camera throughout construction to document the building process of the DWR School of Architecture.	**4.33**
10	Document existing building conditions that became part of the construction process (cracks in walls, utility line relocation, ...).	**3.93**

Question	*Survey questions presented to faculty*	Assessment Value
11	Set up a library of weekly/biweekly construction site photos.	**4.33**
12	Document the construction scheduling process vs. actual construction time.	**3.93**
13	Document the Job site construction meetings for use in classroom settings.	**3.96**
14	Document the alterations to existing structure during the renovation process.	**4.40**
15	Document the Asbestos abatement process within the existing building.	**3.32**
16	Document the cost estimating process used by the contractor vs. actual cost of construction.	**4.25**
17	Document the schematic design team's work and the development of the project to the final design.	**4.57**
18	Document the ADA requirements included in the building design.	**4.13**
19	Develop a set of seminar presentations (.ppt) dealing with the design & construction of the DWR School of Architecture.	**4.43**
20	Document change orders and other revisions as the project progresses.	**4.11**

Figure 6: Results of the faculty survey on the documentation process

agreeing with the statement given on the survey. Through discussions with the faculty team, it was decided that as a starting point, any item that was evaluated with a score of 4.00 or higher would be given consideration to be included in the documentation process.

Any score between 3.50 and 4.00 would also be given secondary consideration to be included in the process as time and resources permits.

With the survey complete, the faculty then had to make a final decision and begin the documentation process. With additional input during faculty meetings we determined that of the original twenty survey topics, eight warranted thorough attention during the documentation process while four others warranted documentation as time and resources permitted. *Figure 7* shows the topics that will be covered in the documentation process. While these final decisions do not fully correlate with the statistical data of the survey, it was felt that these topics are of importance, warranting their inclusion in the

Topics to be included in the documentation process for the Donald W. Reynolds School of Architecture	
1	Use a stop motion camera throughout construction to document the building process of the DWR School of Architecture.
2	Set up a website for use as a clearing house for data pertaining to the project for use by faculty ***and*** students.
3	Document the sustainable aspects of the design as it pertains to LEED certification.
4	Document and evaluate the new structural systems for the expansion and how it interfaces with the existing building.
5	Document and evaluate the new HVAC systems to be used in the exisitng and new construction.
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8	Develop a set of seminar presentations (.ppt) dealing with the design & construction of the DWR School of Architecture.
9	Document the alterations to existing structure during the renovation process.
10	Document & evaluate the existing structure & how the original building was modified structurally for the 1977 renovation.
11	Document the Job site construction meetings for use in classroom settings.
12	Document the ADA requirements included in the building design.
	Topics to be documented as time and resources permit

Figure 7: Topics to be covered in the documentation process

documentation process. The faculty is of the opinion that through a collaborative effort the process can be successfully accomplished. Due to budgeting problems with the project and the subsequent redesign, the demolition work within the existing building did not finish until January of 2008, with the expansion construction beginning in the first weeks of March. This has given the faculty a chance to get mobilized in documenting the existing building and in setting up for the task of implementing a plan to be used during

construction. Presently, a website for use by the faculty and students is being designed and will soon be accessible to all within the School of Architecture. Additionally, tours of the construction site that began last fall continue to occur at regular intervals. These tours are being conducted by a mix of project architects, engineers and contractors involved in the project as well as by faculty members from the school. Many of the students have taken advantage of this opportunity to see the construction process of what is to become their home in the near future.

Figure 8: Site tour of the existing building during the demolition process

Another documentation process that has begun is implementing the time lapse camera to help in documenting the construction visually. The camera is documenting the construction of the West wing addition of the new construction and is being composed in such a way as it will be made available to students and faculty at regular intervals during the construction of the project. Discussions have also begun on the topic of hiring students to help in the documentation process and though as of the writing of this paper no students have been hired we are hopeful that we will be given this opportunity.

Figure 9: Stop motion camera documentation of construction of West wing of expansion

Conclusion

Collaboration within OSU's School of Architecture will be necessary over the coming years for the documentation of our new School of Architecture to be successfully achieved. This opportunity for using a new school of architecture as a teaching tool has been given to the faculty of this university, and it must not be squandered. The decision as a team to document this process is one that will give back to the students for years to come, and the extra work we put forth at this time will be used to educate the present and future students of this school. The school faculty has now begun not only the documentation process for the building construction but has also begun using the expansion and renovation of the School of Architecture as a teaching tool to better the education of our students.

Bibliography

1. Nasar, Jack L., Preiser, Wolfgang F. E., Fisher, Thomas; Designing for Designers: Lessons learned from Schools of Architecture, Fairchild Publications, Inc., 2007.
2. Felder, Richard, "Reaching the Second Tier: Learning and Teaching Styles in College Science Education.",*J. College Science Teaching, 23*(5), 286-290 (1993).
3. Felder, R.M., and Brent, R., "Designing and Teaching Courses to Satisfy the ABET Engineering Criteria," Journal of Engineering Education, Vol. 92, No. 1, 2003, pp. 7-25.
4. Austin, Ann E., and Baldwin, Roger G., "Faculty Collaboration: Enhancing the quality of scholarship and teaching", Washington, DC: School of Education and Human Development, George Washington University, 1991.