

ABANDONING THE LECTURE: USING JOB MEETINGS TO TEACH WITHIN AN INTERNATIONAL, PROJECT-BASED LEARNING ENVIRONMENT

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Abstract

This paper looks at the notion that lecturing is not necessarily the most appropriate delivery method for Architectural Engineering Technology courses that rely heavily upon recreating the work environment within the classroom. The architectural project method is one that is time-tested in architectural design schools, yet has been less embraced within engineering and technology courses that tend to have a history of teacher-centered, lecture-based teaching methods. The project - based method also mimics the architectural industry, where information is often dispensed in meetings rather than in formal lectures. To create a realistic portrayal of industry, and to manage a unique project that will be discussed herein, job meetings were used to dispense information rather than teacher-centered lectures.

The discussion in this paper is based upon the use of job meetings within a particular course: Residential Construction. The prime purpose of this course is to produce a set of working drawings for a wood framed house. This paper reflects upon a unique, international project developed for this course that involved three countries (Canada, the United States, and Indonesia). In an attempt to organize the large quantity of information that was generated through E-mails, digital photos and video conferences, job meetings were introduced into the classroom as a means of quickly relaying information and delivering course content. Rotating job captains were designated as information gate-keepers that had to organize and lead meetings. As the information dispensed from other students in other countries often lacked critical detail and finely-honed English, the job meetings served as a daily place to gain and sort out valuable information relevant to keep the project moving ahead. All of this was documented and kept within a learning portfolio/ binder that kept records of the paper chase throughout the project.

1.0 Introduction

The following paper examines the notion that lecturing is not necessarily the most appropriate delivery method for Architectural Engineering Technology courses that rely heavily upon recreating the work environment within the classroom. In contrast to lecture based teaching, the project - based method (one that is time-tested in architectural design schools) mimics architectural industry, where information is often dispensed in meetings rather than in formal lectures.

This paper addresses the dearth of architectural research that focuses upon design methods and education. Most research done by architectural educators, as noted by Voyatzaki¹ “focuses on history, technology, social sciences and urban studies,... computer sciences and urban studies, and conservation.” Cross², extends this even further by stating: “There is a near-

universal fear and loathing of methodology, and methodologists are reviled as impoverished creatures who merely study, rather than practise, a particular art or science.”

In contrast and in defense of the need to critically comment upon design educational methodology (and specifically, technical design), this paper focuses upon a particular teaching method used to teach architectural technical construction drawings and design. It is based upon the use of job meetings as a teaching tool within a freshman/sophomore level course within the Construction Technology Department of the Purdue School of Engineering and Technology in Indianapolis, Indiana (IUPUI). The particular course examined herein is Architectural Technology (ART) 155: Residential Construction.

The following discussion begins with a description of the course and the problems inherent in it and proceeds to examine the use of job meetings within this particular course within the context of design theory and activities. All of this is also critiqued around a unique international project that was introduced into this course in the Fall 2004 semester.

2.0 Background Description of the Course

ART 155 (Residential Construction) is a course that is offered in several streams each term within the Construction Technology Department at IUPUI. It includes students that are majoring in Interior Design, Architectural Technology, Civil Engineering Technology and Construction Technology. The prime purpose of this course is to produce a set of working drawings for a wood framed house based upon construction standards and building codes used within Indiana. The house is typically designed by each student at the beginning of the term based upon a set of outline specifications and a fictitious client that has been developed by the instructor. The single family dwelling is located upon a real site within the Indianapolis area or adjacent suburbs (e.g. Carmel, Fishers.)

Students proceed through this process through the typical design stages of conceptual drawings and then quickly move onto technical design drawings using Architectural Desktop 2004. All designs and details are developed in three dimensions, though the output is a standard two-dimensional construction drawing (see Figure 1).

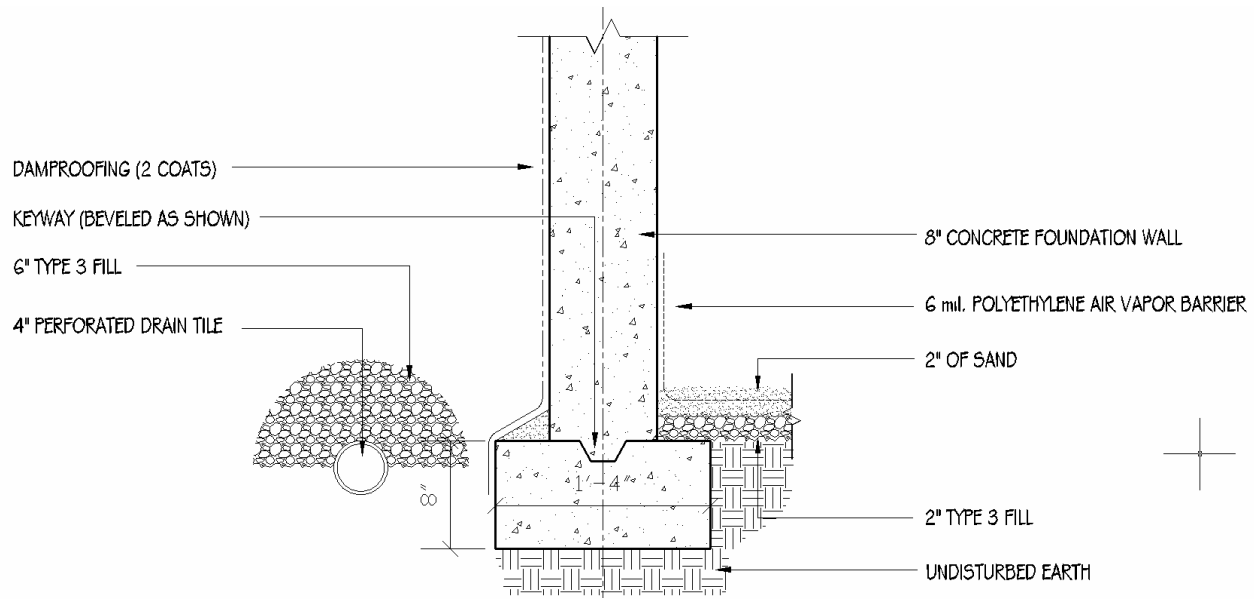


Figure 1: Footing Detail

Note. From Art 155 Project Drawings by Cristina Gaitlin, December, 2004, Reprinted with permission.

3.0 Background Description of the Teaching Methodology

The pedagogy typically used within this course is via a lecture-application format. Students are formally presented theory about construction drawings and wood frame construction delivered by means of power-point lectures or through drawings and formal discussion brought forth on the chalkboard. In this instance, the instructor leads the discussion, prompts students for input, and then delivers a project or assignment where they can apply what they have learned to their design project. Students spend most of their time in the class room working on the computer, developing the construction drawings for their project. As they advance in their project and have been exposed to a substantial amount of theory through lectures, the teaching method then typically changes to individual desk critiques where each student asks questions relative to their particular technical design. Other than formal presentations on behalf of the students and quizzes, the class is typically run like this throughout the term.

4.0 International Project: Fall 2004

This paper reflects upon a unique, international project developed for this course that involved three countries (Canada, the United States, and Indonesia). Participating institutions were the College of North Atlantic in St. John's Newfoundland, Canada and Gadjah Mada University in Jogjakarta, Indonesia. In the Canadian institution the Department of Architectural

Engineering Technology was involved and in Indonesia the students in the Faculty of Architecture were involved.

At the beginning of the Fall 2004 term the students in ART 155 chose to participate in the design of single family dwellings within either the United States, Canada or Indonesia. Students in the other countries did the same, so that each institution involved had students designing houses in three different international locations. In the case of the United States class, this meant that there were approximately eight students within each group and country. Each group of students was organized in closely located clusters within the lab environment so as to encourage dialogue between students working on designs in similar countries.

Preliminary outline specifications and other information were electronically delivered to the students from each participating country. In the case of Canada, information came through either video conferencing or On-Course (an interactive IUPUI web site for all instructional courses). Indonesian information was a little slower to be transferred as their E-mail accounts were small and their University E-mail system kept breaking down. As a consequence they developed a web-site where their preliminary designs were posted (see Figure 2).

5.0 Using Job Meetings within the Classroom

As this project progressed, the instructor quickly came to realize that it would be extremely difficult to deliver three different lectures to the class on each topic that was traditionally delivered through one lecture. What complicated the project even more was that the Indonesian project did not use wood frame techniques and required a whole new set of lectures and construction techniques that the instructor only became aware of as the information streamed in. Often students received the information before the instructor as they were empowered with the gate-keeping of information.



Figure 2: Indonesian International Studio Web Site
Note. From http://www.archiplan-ugm.org/isa_intl.asp January, 2004

In an attempt to organize this large quantity of information that was randomly and infrequently generated through E-mails, digital photos and video conferences, job meetings were introduced into the classroom as a means of quickly relaying information and delivering course content. Rotating job captains were designated as information gate-keepers that had to organize and lead meetings. This is in keeping with the notion of Rogers³ in his seminal work on innovation diffusion, whereby gatekeepers are often the ones within an organization that control the information and flow of new ideas. Without this top-down organizational structure, the job meetings would possibly become too chaotic. As the information dispensed from other students in other countries often lacked critical detail and finely-honed English, the job meetings served as a daily place to gather and sort out valuable information relevant to keep the project moving ahead. All of this was documented and kept within a learning portfolio/ binder that allowed each student to keep records of the paper chase throughout the project. At each meeting the job captain ran the meeting while another student was assigned to take the minutes. The instructor served as an interpreter of the more challenging information and edited student comments, but, for the most part, the students led the meetings and developed conclusions as to how to proceed with the construction drawings.

6.0 The Design and Educational Process

It is important to note how the use of job meetings addresses the necessary activities involved in the design process. As noted by Zeisel⁴, the activity of design has three elementary activities: imaging, presenting and testing. Imaging, Bruner notes in Zeisel, is the ability to “go beyond the information given... to develop something where nothing was before”. Presenting requires that the designer present ideas to make them visible; and testing involves: “stepping back and appraising, refuting, criticizing, judging, comparing.” (Zeisel⁴).

In this particular course all three of these were addressed within the job meetings. As information was often in the form of vague wording or a site/construction process pictures (see Figures 3, 4)

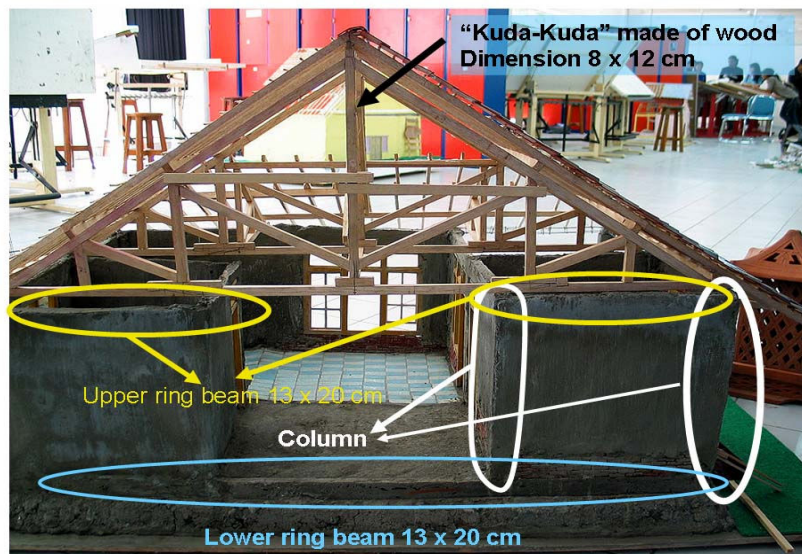


Figure 3: Indonesian Construction Model Note. From: GMU Architecture Department



Figure 4: Canadian Site Picture Source
Note. From: College of the North Atlantic

technical design concepts often had to be imagined (modeled, Archer⁵) and presented through drawings during the job meetings. These often occurred “on the fly” and the students got to see the instructor (or other students) designing and making critical decisions on the spot, much like would take place within a job meeting in industry. This also allowed the instructor to use techniques such as mental mapping (Hart, Wil & Bradford⁶) and experiential types of learning (Kolb⁷) that have been noted as being successful methods to engage adult learners (e.g. Scherf⁸) in imaging problems.

The presentation activity that followed the imaging was not the traditional, formal presentation method that had been part of this course in Residential Construction in previous semesters. Students and the instructor were often presenting ideas on paper through quick, conceptual sketches that forced students (who were lax in leaving the comforts of AutoCAD) to use traditional sketching techniques that are often used within job meetings in industry. The lack of sketching in an environment surrounded by computer technology is often something that is bemoaned by other instructors of the same course. The use of sketching is also something that is supported within the design literature (e.g. Akin⁹) who notes that sketches “are strictly useful in acquiring and assimilating external information. As soon as an internally assimilated representation of the problem context is formed a physical representation is developed and the design activity begins.” The key item to note here is that Akin mentions “as soon as”, meaning that the process should occur rapidly. In rapidly sketching out the construction concepts from other countries, this led almost immediately to discussions on how it related to wood frame, Indiana residential construction methods, and certainly surpassed the speed of designing that had been taking place on the computers. It also forced the U.S. Indonesian group to comprehend North American wood frame construction techniques as they often were asked to explain the Indonesian construction concepts and techniques in reference to wood frame details that the other groups were developing.

Deformalizing the lecture-based course also seemed to lend to more involved criticism on the objects being designed, as the decisions on how to design were being made right in front of each student. “Stepping back and appraising, refuting, criticizing, judging, comparing”... was an activity that students embraced within this context of eight students whereas they were less reluctant within larger group settings. As Caudell and Scott¹⁰ note: “One of the beauties of team interchange is that when an idea emerges, it is batted about like a shuttlecock.” As a result, perhaps the group that emerged as the most effective (the Indonesian group received the highest individual grades in the course) was one that was forced to meet the most and banter ideas about on construction concepts that they had never seen before.

7.0 Summary and Opportunities for Future Research

It should be noted that this entire project was an exploratory adventure in teaching. Often times, before the class met, the teacher hadn't received the information that he would be critiquing, nor had some of the other students. It required a willingness on all involved to treat education not as a delivered “sermon from the mount”, but rather an interactive experience that had few experts within the midst of the team discussions. As there was a lot of unorganized, spontaneous activity in the classroom, the job meetings served as the most formal educational experience that occurred during each class period once the projects had established their own momentum. Further study is needed with respect to the gathering of questionnaires and similar feedback that would enable the collection and analysis of data and would quantify the findings that have been descriptively noted within this summary paper.

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