Chapter 8
Applying BIM in Design Curriculum

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ABSTRACT
This chapter presents an educational case study of applying Building Information Modeling (BIM) as an integrated design platform for interdisciplinary building and construction projects. The course is meant to focus on utilizing BIM for commercial construction. Students examine 3D geometry, spatial relationships, geographic information, quantities of materials, and properties of building components in this course. The students also learn the processes that make up BIM so they will be able to apply this information in a company. The purpose of the initial study was to assess the need for and receive feedback on the syllabus of the first commercial construction computer graphics course at Purdue University through a survey that was sent to industry professionals. The class was taught in the Fall 2009 semester and was successful according to the students in what they learned. The course was a 400 level course in which both upper level undergraduates and graduate students participated. The professor took the approach of a real world job and incorporated it into the content of the course. This chapter will discuss the initial case study of industrial professionals, the initial course creation, the development, and ultimately the final curriculum delivered within the course, as well as student feedback received at the end of the semester.

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INTRODUCTION
Construction has been an ever evolving industry with changes in technology as well as materials and method used to construct buildings. It is this change that has prompted Purdue University’s Computer Graphics Technology (CGT) department to take a look at the current curriculum for the focus of Construction Graphics Technology to update it to those changes in industry. The curriculum in the past was focused on residential construction with a hint of commercial construction graphics. With the Architectural, Engineering, and Construction (AEC) economy in the current situation it is in, students were having an impossible time finding...
Applying BIM in Design Curriculum

employment in the residential construction area after graduation. There were a selected few though that were interviewing for commercial construction positions, and obtaining them. The reason for their employment was those students took control of their education and went to the Building Construction Management (BCM) department within the College of Technology and took additional construction courses. This additional education was the deciding factor for obtaining employment. Ultimately the problem of the study was to determine a need from construction professionals if there is a lack of education in the College of Technology’s construction graphics area that delivers Building Information Modeling (BIM) to Purdue University CGT students for their future profession. The study evaluated the CGT 460: Building Information Modeling for Commercial Construction course content to provide feedback from the industry who will potentially be hiring Purdue University CGT graduates. This study collected and analyzed demographic feedback, course curriculum feedback, and general course comments to improve and align it with industry standards.

The chapter will give a background as to current AEC technological trends; followed by a process & survey created for the AEC industry in order to create a curriculum dictated by industrial standards; identify a sixteen week curriculum outline defined by the AEC professional’s survey; talk about implementation of that curriculum into a new course proposed in the Fall 2009 semester at Purdue University, and lastly give results in the form of feedback from students who took the course. From the above information, the author has analyzed the feedback and has drawn some conclusions for the future of the course to make it substantially better.

Objectives of Survey:

- Review of current AEC technological trends for construction education
- Identify Building Information Modeling in higher education curriculums
- Review 16 week outline for proposed course
- Identify focal BIM standards within curriculum
- Review of course setup and implementation
- Identify key components that made course successful
- Identify key components of course that need improvement

BACKGROUND

The popularity of BIM in the commercial construction industry is increasing everyday (Sullivan, 2007). A recent survey of construction projects and program owners stated that more than one third of them used BIM on one or more of their projects. This further illustrated that educational settings are in need of creating new courses and challenging existing ones to facilitate the need of industry (Building Design and Construction, 2007). The educational and industrial programs that focus on construction graphics are at the front of this need. Companies are recruiting students with computer graphics skills to BIM positions because of the modeling knowledge. Most construction companies are slowly redefining their efforts to incorporate BIM technology and methods. The contractors are “using 3D technology to identify interferences, link data to schedules, and produce 4D (four dimensional) animations, which help discover dynamic interferences of construction activities” (Constructech, 2007, p.25). These companies are looking for individuals straight out of college that are knowledgeable about computer graphics and have a good sense of visualization in construction. Merriam-Webster (2007) described visualization as the “formation of mental visual images or the process of interpreting in visual terms or of putting into visible form”. It is suggested that visualization tools may help enhance