

# **AC 2007-2214: CAPTIVATING THE CROWD WITH HYBRID TEACHING**

**Darrell Nickolson, Indiana University-Purdue University-Indianapolis**

# Captivating the Crowd with Hybrid Teaching

## Abstract

### From What!

Traditional Architectural Technology courses often consist of in-class sessions that compete for sparsely available class room space and force students to arrange their busy schedules around a predetermined time table. To alleviate this, and to embrace several new technologies, a new hybrid course in architectural technology is discussed herein. Hybrid courses are those that combine the traditional learning environment with distance education components. This paper discusses how this will allow students the freedom to use learning tutorials & lectures that have user controls to fast forward and rewind, group chats, and review exercises to assess their retention of the content.

### To What!

This paper discusses the transformation of an introductory Construction CAD Drafting course offered to both architectural technology and interior designer students. The course is designed to teach students the basics of composing electronic construction design documents while at the same time teaching them how to use Autodesk software, mainly Auto CAD and Architectural Desktop. Several innovative and interactive software programs were used, including Macromedia Captivate and Breeze Presenter, Inlet, Flash, & Oncourse CL. All these software packages in some form have the ability to disseminate information that gives students the ability to control the amount of content they receive in a period of time, and at the same time whenever and wherever.

### Improved Pedagogy and Assessment

Students are constantly immersing themselves in the latest and greatest technology, as evident on most college campuses they can be seen listening to their iPods, reading their smart phones, or logging in wirelessly with their laptop computers. The technology allows for faculty to reach students in a manner that is common to them. The success rate of this type of course while new, is already being felt at several universities around the country. For example Gordon Hensley states that two institutions, University of Central Florida and University of Wisconsin-Milwaukee have conducted examinations of hybrid courses, and their effectiveness. A noteworthy outcome from this examination, as Hensley points out, is the impact it had on faculty at the University of Wisconsin-Milwaukee: “almost universally report their students learned more in the Hybrid format than they did in the traditional class sections”.

## Body of Paper

### 1.0 Introduction

This paper will examine the process of using hybrid teaching applications in the disciplines of architectural technology and interior design. Unlike traditional distance education which solely relies on the use of electronic media to communicate all course content to and from the faculty and student, this hybrid course format relies partly on

electronic media and partly on face-to-face traditional teaching methods. It will examine and compare the results of traditional teaching methods in these fields to those of hybrid education, and investigate the improvements this process also has on the pedagogy.

The premise of this paper is based on one course in particular that was the neophyte hybrid course in the Design Technology Program at the Purdue School of Engineering & Technology on the Indiana University Purdue University Indianapolis campus, focusing on architectural technology and interior design technology. This course was based on teaching computer aided design techniques using Auto CAD, and Architectural Desktop software. It examines the types of methods used in developing this one course as well as a process in which future department courses could follow. This paper will then examine methods of assessment and positive impact on student teacher relationships.

## 2.0 Background

During the spring of 2006 results from the previous semester's student evaluations showed a disconnection between students and faculty in terms of using technology, and also showed an increasing stress on facilities, such as lab space and classroom lecture hall space. Also during that same semester Indiana University Purdue University Indianapolis handed down a mandate to all faculties to investigate increasing the number of internet based courses, and to better use the technology at our disposal to help disseminate information to students beyond traditional teaching methods. With so many on-line universities, recruiting is becoming a game of who can best attract students with the best and most versatile technology and innovations.

The software being taught in this particular course as mentioned are Auto Desk Products, Auto Cad and Architectural Desktop. These are two software packages used widely in the Architectural and Interior Design industries. They allow the user to create construction documents in floor plan and elevation views, as well as 3D drawings, massing model studies, and to create schedules of all types.

## 3.0 Development

These developments set the stage for finding the right course to develop into this hybrid teaching tool to answer some of the previously noted issues, as well as provide students with a solid foundation to the Design Technology Program. The course that was chosen is one required by all incoming freshmen in their first or second semester at Indiana University Purdue University Indianapolis. A major part of the development of the course was an intensive 8 week process in which the expertise of the campus Office of Professional Development was enlisted, along with the staff of the campus Information Technology Department and the Digital Media Services.

The week began with an intensive four-day workshop in May that focuses on best practices in online course design and couples faculty members with an expert support team. A cohort of 8-10 faculty members participate in the program as seen in **Figures 1 & 2**. . By the end of the week, the faculty member, in conjunction with the support team,

had created the design document for a prototype module for the course and had developed a work plan for the creation of the rest of the course. Some of the results from this session were:

- ✓ Full immersion in the process of designing hybrids
- ✓ Working in a community of faculty going through similar process, but from different departments and disciplines on campus
- ✓ Consultation and production support from software design experts
- ✓ Instructional design consultant from graphics experts
- ✓ Instructional technology consultant from information technology experts
- ✓ Working closely with a subject specialist librarian
- ✓ Working closely with a copyright management consultant



Figure 1. Collaboration Work Room

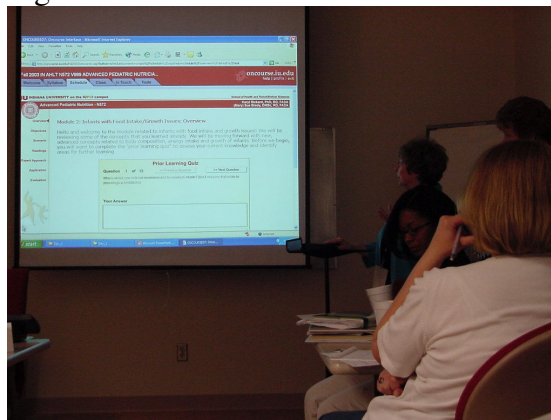


Figure 2 Collaborative Working Sessions

After four days of collaborative sessions the development of the course was moved to a streamline mode, in working to define the course content, including “chunking” information into modules, developing short video movies with audio for viewing purposes by the students, interactive review exercises to assess data retention, creating module specific vocabulary list, and additional resources areas. This campus initiative is to use a program called Oncourse as an interactive learning tool. This software allows for communication between faculty and each student in the class, communication between all students in the class, and the ability to store information for students to view anywhere they have internet access. Most departments on campus stop at that point, but in the Design Technology Department we have investigated further and found other nuggets in

the program that lend themselves to the multimedia approach of teaching Architectural Technology.

The Oncourse program allows for embedding websites, attachments, links, movies, and very large file types related to digital media. It also gives provisions to create shared file locations that give the ability to view and edit files in a group setting. This can be in the form of a Drop Box in the case of drawings that can be stored and viewed by everyone on a design team. Another great component underused in Oncourse is the Wiki, which is a domain that allow space to create editable documents that can be accessed by users, with permission. It will track all changes made to the master document, track who has viewed it, and allow for cross communication about the document. In both cases of the drop box and the wiki this is very valuable to Architectural Technology, and the hybrid course that was developed. These areas provided ample locations for students to go and review the content and in some cases share their results from assessment exercises, give feedback on tutorial videos, and to store in-progress files.

All these factors discussed above led the development of the website used in this hybrid course. The first step was to develop a template that could be used for every module. This was done using basic PowerPoint slides to explain what each section on a module page needed to accomplish. See Appendix A the module template.

Once the template for each module was decided upon, the website could be created. The site, while created with it's on URL, is houses in Oncourse, under the course number, and accessible to every student that registers for the class. Oncourse, also give the ability to add the site link to any other class that could benefit from the Modules. Multimedia is the term of choice for this hybrid course, based on the fact that the website has many user tools, and also because there were many multimedia tools used to create the site.

The first part of the course that was created was the most interactive as well. The use of Macromedia Captivate allows for the creation of customized tutorials, created by the faculty member that can be compressed into file sizes small enough to play on an iPod, pocket PC, laptop, or a standard desktop computer. A member of the Macromedia product suite, Captivate is a program that embeds itself in the user's computer, and allow the recording of on-screen motions such as mouse movement and transition to and from different screens. It allows the user to use closed caption text for the hearing impaired or those that are using a computer with no audio. The most exciting feature about captivate is that it allows the one creating the tutorial to record audio that can be played while viewing the tutorial, giving more detailed instruction to what is being viewed.. There is also a command in the captivate software that affords the opportunity to modify languages of the audio or the closed caption text for those times when they need to be created for user groups that use or read different languages, and while limited, this may allow someone to have a better understanding than they would in face to face setting where there is no opportunity to change or modify translation. This allows for a more multicultural approach to the course content and how it is disseminated. See Appendix B for an example of a Captivate recorded screen.

Another very interactive component of the hybrid course modules are tools of assessment used by the students to review content in the captivate tutorials, and to gage their retention of the content. From an assessment standpoint, there must be two standard ways to assess if this data is effective, and that is from the student end and from the faculty end. To that point, the assessment exercises are created to give students the freedom to take them un-graded, and without recorded results. In comparison to traditional delivery methods of this course type, where students normally get one opportunity to take review exercises, the modules afford students the freedom to take the as many times as needed, and even the ability to view the tutorial movies and do the assessment exercises at the same time.

These assessment tools were created using a program called Inlet. A question and answer template, Inlet allows the creation of quick 5, 10, & 15 question review exercises, giving the option to create them as multiple choice or short answer. A software licensed by Indiana University, it is available to all faculty on all the Indiana University campuses, but is more widely used in the Business, Math, and Accounting Schools. I viewed Inlet as the perfect solution to a review exercise after watching the captivate tutorials. By writing all questions in a basic Microsoft Word document, it was a quick copy and past to create exercises. The exercises are able to be set up as basic quizzes, group reviews, even game like environments where you loose a turn for every incorrect answer. They student also has the option to have their results recorded for their own personal viewing. See Appendix C for an example of an Inlet Assessment Exercise, and instruction on its use.

Programmatically traditional architectural technology courses at Indiana University Purdue University Indianapolis must have clearly stated objectives, as any engineering school with ABET accreditation. This, in conjunction with the University's Principals of Undergraduate Learning (Hamilton <sup>3</sup>), was the main emphasis of the module templates, as the objectives must be clear and concise. The PUL's as they are referred to, are a set of agreed upon criteria that every course on the IUPUI campus must abide by. While it is understood that every department may have different teaching objectives and methods, the PUL's provide minimum requirements that all courses should strive to achieve in regards to citizenships, content specific to the industry, preparation for "real world" work, and a means of assessment by both faculty and students. In conjunction with the PUL's the use of one of the leading researchers and developers of assessment (Bloom <sup>1</sup>), was used in the approach of classifications of levels of intellectual behavior. Clearly stated, each module was created to address the progression of thinking, in the course bases on learning the Auto Desk software, and how each module builds upon the other from the literal level to the process of evaluation.

The last part in developing the module templates were adding an active link to each page allowing the user to view a glossary of terms for that specific module. Using Dreamweaver software, allows for the constant update of the module glossary as the course content grows. Dreamweaver is software widely used in the information technology world, to maintain websites, and update content. See Appendix D for a view of one of the module glossaries.

With the Module template complete with the Captivate Tutorials, Inlet Assessment exercises, and the Link to Glossary of Terms, it was on to creating a few more interactive tools to capture the student's attention. To make the course as up to date as possible for the technology craved students there were some Flash Movies created to introduce the Auto Desk CAD software. The movies, able to be played on any machine that can handle a flash component, explain in detail all the software can do, and what the students will be learning throughout the semester. These flash movies created from Macromedia Breeze PowerPoint slides allows the author of the slides to add audio voice files. These voice files were then saved in sequence into one looped audio based image.

The course format also includes areas for chats and postings of projects and other resources that have to be assessed as well. Rubrics are given to every student to do a self assessment, on topics of participation, student posting, etc. (Hamilton<sup>3</sup>). See Appendix E

#### 4.0 Feedback

Improving pedagogy is found through the feedback from students during test runs of the hybrid course content. Surveys were conducted with students that had completed the traditional section of this particular course, and then asked to review modules that would have been used in a hybrid course. The thought process behind this was each of these students have successfully learned the content through traditional means, and is now questioning if they are able to pick up any new pieces of information while viewing the same content in a different delivery method. Here are some of the responses given by these students:

*Student A: "With this list of objectives students will have a means of self-assessment which promote confidence, and encourage progress. Also, self-assessment is further reinforced in the exercise component imbedded within the module. All of this makes the structure of the course very suitable for independent study and skill acquisition."*

*Student B: "I think that someone who is very computer knowledgeable should have an easy time with this lesson. I think that I personally got more out of having you explain and demonstrate the lesson in front of me while I was following along on my computer".*

*Student C: "I really like these modules as a teaching tool. The student has the ability to watch everything step by step and has the opportunity to rewind it if something is unclear. This style of learning is also beneficial because the material is written down and displayed in a manor that there is no human interruption, as there would be in a classroom environment".*

While all students didn't and won't succeed using hybrid courses in architectural technology education, student B's comment above is the one that allows for the best assessment of this type of course, which in turn can have a significant impact on improving one's pedagogy. The standard thought behind hybrid teaching is combing traditional classroom settings with the use of electronic media, and sharing information in some manner. Using technology to deliver information is not new in education, and

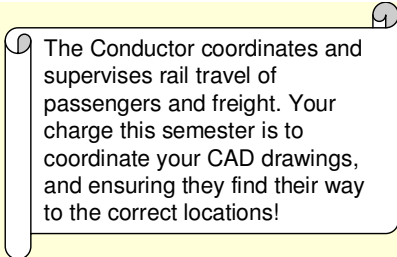
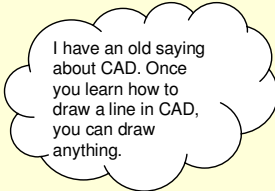
definitely not new in architectural education, but the holistic approach taken in this course format is. Empowering the students is the ultimate goal, and using technologies like Macromedia Captivate to create the tutorial sessions, Inlet to create the self assessment exercises, Macromedia Breeze & Oncourse to create open lines of communication between teacher and student during the non face-to-face sessions go a long way at doing that. The campus is better for it as well, because the crunch for classroom space can be alleviated to an extent, traffic on campus can be reduced with more students learning off site, and faculty can be more productive if they multi-task and take advantage of the non face-to-face time to do more research or more course development.



## Appendix A Module Template



### CONDUCTOR



#### OVERVIEW

In this module you will gain insight on how to navigate the Auto CAD menus and create basic images. CAD has become more user friendly now that it follows a standard windows format and look with the pull down menus, icons, and use of the keyboard.

#### OBJECTIVES

Upon completion of this module you will be equipped to do the following:

- Set up and save files
- Begin to use the draw menu
- Understand different view options CAD offers
- Set up basic print job
- Modify drawing (undo & erase will be your Best Friend!!)



#### EXERCISES

Click on the link(s) below to self assess your understanding of Auto CAD. These are un-graded exercises that provide you with practice at recognizing and identifying screens, commands, terms, and images.



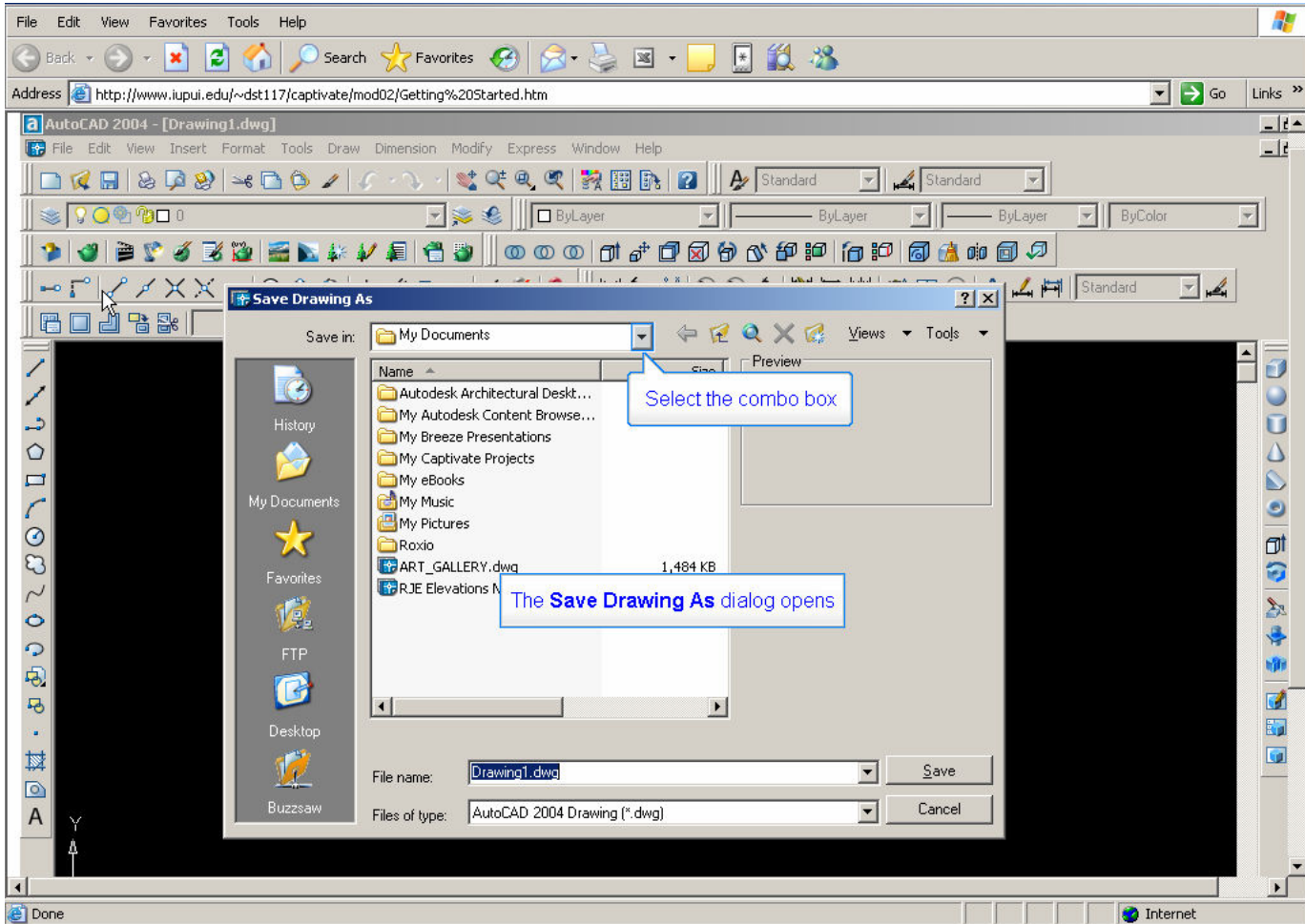
#### GLOSSARY

Click here for a list of terms and definitions that will be used throughout this module.

#### DELIVERABLE

See Oncourse Assignment Tab for project Deliverables.

## Appendix B Example of Macromedia Captivate Recorded Screen



## Appendix C

### Example of Inlet Assessment Exercise

Module 2 Quiz

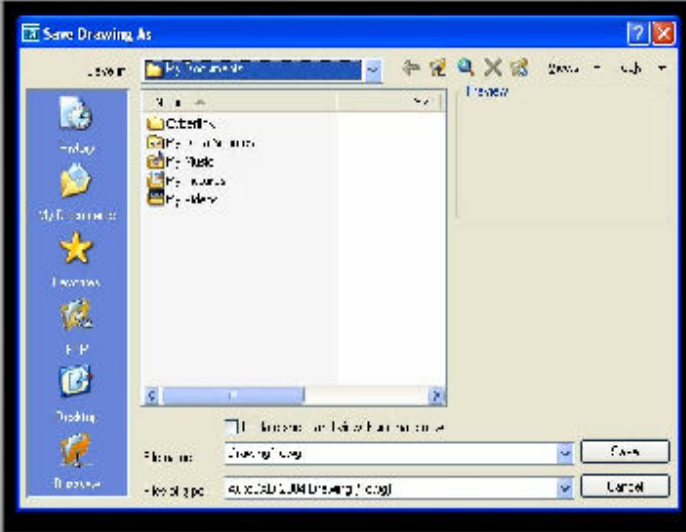
Question 1 of 10

When working in the lab, what is the safest location to save your file to?

Feedback

Choices

- A H: Drive
- B A: Drive
- C Desktop
- D C: Drive



The screenshot shows a 'Save Drawing As' dialog box from AutoCAD. The current directory is 'C:\Users\user\Documents'. The file list shows folders for 'C:\Users\user\Documents' and 'C:\Users\user\My Recent Documents'. The file name is 'Drawing1.dwg' and the file type is 'AutoCAD 2014 Drawing (\*.dwg)'. The 'Save' button is highlighted.

## Appendix D

### Example of Module Glossary of Terms

---

#### Module 4

- **AIA** - Layering system created by the architects institute.
  - **ANSI** - American National Standards Institute. Coordinator of voluntary standards development for both private and public sectors in the United States.
  - **External Reference** - A drawing file referenced by another drawing.
  - **ISO** - For International Standards Organization.
  - **Layout** - The tabbed environment in which you create and design paper space layout viewports to be plotted. Multiple layouts can be created for each drawing.
  - **Layout Viewports** - Objects that are created in paper space that display views.
  - **Model Space** - One of the two primary spaces in which objects reside. Typically, a geometric model is placed in a three-dimensional coordinate space called model space.
  - **Paper Space** - One of two primary spaces in which objects reside. Paper space is used for creating a finished layout for printing or plotting, as opposed to doing drafting or design work. You design your paper space viewports using a layout tab.
  - **Polyline** - An object composed of one or more connected line segments or circular arcs treated as a single object. Also called pline.
  - **Viewport** - A bounded area that displays some portion of the model space of a drawing.
-

## Appendix E

### Example of Module Glossary of Terms

SP07 IN INTR 428 22651 worksite

[Home](#)

[Syllabus](#)

[Roster](#)

[Calendar](#)

[Assignments](#)

[Resources](#)

[Gradebook](#)

[Message Center](#)

[Announcements](#)

[Email Archive](#)

[Chat Room](#)

ART-117 Test

[IU News](#)

[Official Final Grades](#)

[Site Setup](#)

[Wiki](#)

[Help](#)

### ART-117 Test

[Options](#)

**IUPUI** INDIANA UNIVERSITY PURDUE UNIVERSITY INDIANAPOLIS

**CONSTRUCTION CAD DRAFTING - ART 117**

Darrell D. Nickolson

Design Technology, Purdue School of Engineering and Technology

#### Modules:

- Module 1: [What is CAD](#)
- Module 2: [Basic Drawing & Printing](#)
- Module 3: [Layers & Line Edits](#)
- Module 4: [External Referencing](#)
- Module 5: [Getting to Know ADT\(Architectural Desktop\)](#)
- Module 6: [ADT Tool Pallet](#)
- Module 7: [ADT Elevations & Sections](#)
- Module 8: [CAD Secrets](#)

Last updated: July 26, 2006  
Copyright © 2006, The Trustees of [Indiana University](#)

## References:

1. Bloom, B. (1984). *Taxonomy of Educational Objectives*. Boston, MA: Allyn and Bacon.
2. Clark, S.L, Mayer, R.E. (???) *e-Learning and the Science of Instruction*. ??????????
3. Hamilton, S.J. (2003) *On the Road to Campus Consensus of the PUL's at IUPUI*.
4. Morey, A. I.; Kitano, M.K. (eds.) (1997). *Multicultural Course Transformation in Higher Education: A Broader Truth*. Needham Heights, MA: Allyn & Bacon;
5. Bauer, J.F. (2002) *Assessing student work from chartrooms and bulletins boards* (eds.) *Assessment strategies for the online class*. San Francisco, CA: Jossey-Bass.