

Chapter 2

The Online Course Maximizers: Visualization, Gaming, and Analytics

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ABSTRACT

The purpose of this chapter is to show how making content more visible, placing it in a gaming format, and using analytics techniques for continuous improvement, will enhance online teaching and learning. This is achieved by using online tools and techniques such as interactive and visual video presentations and discussions, colorful graphics, charts, images and interactive games while using analytics software to gauge their effectiveness. The goal is to maximize online course effectiveness—and at the same time, learning. The formula is straightforward. Visualize the content (make it more spatial), game the content (make it more interactive), and analyze (examine carefully and in detail) both the instruction and the learning for continuous enhancement. Educators often offer one of these instructional maximizers as the savior of online course effectiveness but seldom consider the positive synergistic effect in integrating and using all three at the same time, as this chapter will do.

INTRODUCTION

This book chapter will show that a growing body of literature verifies that visual/spatial information, particularly if placed in an interactive gaming format, have potential for enhancing online course content and instructional effectiveness for all online courses but in particular for difficult subjects such as math and physics. This same approach may also be effective for use with students with learning disabilities by turning difficult text information into visual relationships and images that they can more readily and easily understand. The research also indicates that this same approach would be effective for normal students taking regular courses. It is anticipated that this chapter will explain and generate new information and reports of success, using these maximizers, not yet widely reported or considered, while further validating how powerful *visualization, gaming, and analytics* can be in enhancing teaching and learning. Additionally, the paper includes a report on how the findings of recent brain research and some assistive technology innovations can complement and support these maximizers in instruction. As just one

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example of the power of visualization, one need look no further than smart phones and tablets and how they are being used—primarily to interact with visual data-- in relationships to other people. Specifically, Facebook pictures, selfie photographs, GPS maps, YouTube Videos, Scene Captures, Action Videos, and Games! Imagine the possibilities of placing educational and instructional content and programs in a visual format on a mobile device that is connected to an online course. Consider, for example, how students' interests are gained, engaged, and developed. It is done by *making them visual and game-like and building in some analytic measures!* Finally, tools/techniques covered in this chapter, which support this approach, are advanced interactivity such as online video chats, video conferencing presentations, math games, and calculation/analytic displays. This chapter explores the research and cites examples supporting the use of these three maximizers to enhance instruction and learning. It also speculates on how the integration and synergism of all three could be the tools for which educators have long been searching.

BACKGROUND

Online Programs Initiation

The author's first experience with online academic courses and related educational technology began over 10 years ago when National University (NU), whose main campus is in La Jolla California, began placing some of its courses online, based on some guidance and assistance from Stanford University which was reputed to be the first university in California start an online academic program. The Blackboard Learning Management System (LMS) was the NU online platform on which the first classes were designed, developed and placed on line. The first courses at NU were primarily text oriented and were, in essence, just the text oriented content of the on-site classes moved on-line. There was almost no content in multimedia and those classes that contained PowerPoint presentations were considered high tech.

Online Courses Technology

Coming from an Information Technology (IT) background, the author was familiar with various presentation software and was considered one of the faculty with high tech courses since he had several PowerPoints in all of his classes. He became a most sought after "technology" expert by other faculty members who wanted to add PowerPoints to their classes. In time, NU changed from the Blackboard LMS to the eCollege LMS and added an embedded video teleconferencing system into the classes for faculty to use for academic purposes. Setting up and conducting live video teleconference sessions with students was challenging for most faculty members, especially those who considered themselves "digital immigrants" with low technology skills.

Online Programs Growth and Competition

Overtime, however, a faculty that was initially resistant to and critical of online courses and, in particular, the technology that had to be mastered in order to be a successful, bought in to online teaching and embraced it. As more and more schools and universities began to see evidence that online courses were not inferior in quality to onsite courses, that such courses provided greater flexibility in time and

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