EFFECTIVE DESIGN, INSTRUCTION AND ASSESSMENT OF AN ON-LINE ENGINEERING COURSE

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The emergence of life-long learning has been a happy result of the explosion of information and the much wider availability of information through the Internet today. The Internet is battling its way into higher education by offering a flexible and accessible alternative for busy people who want to pursue higher education. However, questions have been raised whether online instruction can replace traditional programs any time soon, particularly in engineering schools. Many higher educational institutions are increasing the visibility of their traditional programs by offering online options. Still, many academicians debate whether online education can effectively communicate the essence of the lecture without compromising on quality. However, experts affiliated with traditional programs hesitate to denounce online education since it's the best option for some people and the Internet has proved useful in augmenting the resources available for use in traditional classrooms.

In this age, it appears that students want more instruction, integration, team building, communication and quantitative skills, and real world case studies, projects, and problems. This is indeed a tall order and one that no single professor/system is likely to be able to provide. On first blush, satisfying students' wants appears to be a difficult challenge in today's environment in particular, in the instruction of engineering courses. Yet, response is essential. Although the online environment provides a convenient tool to accomplish the goals of effective instruction, engineering courses pose some unique challenges. Teaching concepts in subjects such as engineering sciences require easy layout of course materials, and easy, efficient, accurate, and far-reaching facilitation of human interactions.

This paper discusses ways to design an effective engineering online graduate course. This paper provides a unique perspective of how to incorporate project based learning concepts in an online forum. Pertinent details such as ways to incorporate lecture, assignments and laboratory exercises are summarized. In addition, features such as effective instruction and assessment are discussed. Several unique tools that were

developed as well as their effectiveness in the instructional process are discussed. Incorporation of flexible live synchronous tutoring is discussed. This paper also compares the effectiveness of the same class on Networking and Security on the Internet taught by the same instructor online and on-ground. Finally, a list of do's and don'ts developed is summarized.

Keywords: online engineering education; project based learning; live synchronous tutoring; networking and security on the Internet; multimedia