A Global Initiative in Forensic Education

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INTRODUCTION

Forensic science is the application of scientific principles to the legal process and the importance of such evidence in crime investigation has been known for centuries. While training in this field was and still is, primarily acquired on the job, the role of academia in providing education in forensic science began to be realized in the early 20th Century.

In the 1970's there were still only a limited number of quality academic forensic science programs worldwide, but these began to increase in number as the discipline became more reliant on the basic sciences and gained acceptance as a bona fide university degree. More recently, thanks in part to the popularity of TV shows such as *CSI* and the *Forensic Files*, there has been a significant increase in students wishing to study this field. Forensic science courses are now being offered in grade school and there has been a proliferation of undergraduate and graduate programs offered at higher education institutions in the United States and overseas. Forensic science covers a wide range of technical disciplines including many techniques in molecular biology and analytical chemistry. It is also associated with a very visual, "hands-on" laboratory component. This requirement for laboratory-based training has limited the development of online forensic education. However by primarily targeting students who already have the necessary laboratory skills, and incorporating case studies, animations and visual images, we have developed a successful model for graduate level education in this field.

The University of Florida offered its first distance education courses in forensic toxicology in fall of 2000. The program has now expanded into four distinct MS programs: Forensic Toxicology, Forensic Drug Chemistry, Forensic Science, and Forensic Serology and DNA, plus certificates in six specialized areas. The target audiences for these programs include working professionals in crime laboratories, medical examiners offices, and law enforcement with on-the-job experience, a bachelor's degree in a science subject, and a desire to improve their qualifications to enhance courtroom credibility or other career prospects. The program was launched with only 30 enrollments (18 students) in the first semester, and has demonstrated consistent growth, reaching 650 enrollments in the fall of 2007. The 650 enrollments represent 400 unique students from 27 different countries.

This demand for these forensic science programs was so great that that the UF Forensic Science Program responded to requests for the development of global education initiatives. Partnerships with academic or government institutions in Chile, Brazil, Ecuador, Peru, Great Britain, and Australia have been established. Some programs are available in Portuguese and others are currently being translated into Spanish with partners in South America.

BACKGROUND

Distance education is a rapidly growing area of academia with almost all institutions of higher education now offering some form of distance education in the United States (Saba, 2005). When structured correctly, distance education can allow the delivery of quality educational materials to students anywhere in the world 24-hours a day, seven days a week, providing students with an educational experience that equals or even surpasses that of a classroom taught curriculum. Through the development of internet taught courses and e-learning technologies, working professionals now have the opportunity to improve their qualifications without having to leave their jobs, relocate, and disrupt their family life. There is also a benefit to the employer to have employees improve their academic standing, without the loss of trained personnel (Tebbett

et al., 2007). Distance education also provides academic course access to those living in remote areas, including military personnel — one of the largest users in the world (Ellsworth and Lorizzo, 2001) — at home, stationed overseas, and on active duty as well as single parents who might be unable to attend a traditional classroom-based program.

All of the advantages of distance education outlined above are particularly relevant to a discipline such as forensic science where there is a continuous need for practitioners to stay current with the latest highly technical developments in order to maintain credibility as expert witnesses. However, as with similar practical based subjects it is difficult to illustrate laboratory techniques via the Web. While html pages can be used to deliver digital images, their still nature limits the amount of information that can be transferred to the student. As computer software continues to become more sophisticated, the tools required to meet the challenge of teaching highly technical material are becoming available.

The limiting step then becomes the willingness of faculty and administrators to embrace these advances in technology and change their teaching practices (Cho and Berge 2002, Zirkle 2004).

DESIGN, STRUCTURE, AND DELIVERY OF FORENSIC SCIENCE PROGRAMS

Course Design and Structure

The success and quality of a distance education program depends on many factors. One of the more important variables is appropriate instructional design. The UF Forensic Science programs use the web-based course management system, Blackboard VISTA. Each of the forensic science courses is divided into topic modules, typically between 7 to 12, and each module contains video material equivalent to a traditional one hour classroom lecture. Every week or two, one of these modules is made available to the students. Delivery of the course content is enhanced with images and flash animations that describe and explain key principles of the topic being studied. Several studies have stressed the need for easy to use software with optimum module length and format that presents usable information aesthetically. (Pomales-Garcia and Liu, 2006). The goal is to engage the student so that he or she completes the module and understands the concepts that are being delivered. Research shows that the more media in a module, the greater the student satisfaction with it. In addition, shorter modules are perceived as more visually attractive and less difficult than longer modules or modules containing text only. (Pomales-Garcia and Liu, 2006). We have therefore taken the approach of subdividing courses into modules. While the material is presented as text based, links to other Web sites, flash animations and digital images allow us to deliver material that otherwise would be impossible in a regular classroom setting. Examples include ballistics, blood spatter, autopsies and the inner workings of analytical instrumentation. The use of these visual images illustrates the concepts being presented without the need for a laboratory setting. In addition we have found that the use of stimulating and interesting assignments is key to engaging students in the online format.

Learning Objectives, Assignments and Case Studies

Each content module has a series of learning objectives and an assignment that must be submitted to the instructor by a scheduled date. Some course assignments require literature research and many assignments involve actual cases from the instructor's work experiences. Some courses include online timed tests in addition to the written assignments. These online tests are automatically graded in VISTA and the results of these tests are recorded almost immediately in the student's account, giving students rapid feedback on their work.

Case studies are incorporated into courses and simulate the gradual discovery of information while working on a case. In those courses using a case study, information is released periodically and students are asked to explain how the new information — together with what they have learned in the previous modules — affects their interpretation of the case. For example, the information might first come from a first responder who suspects drug overdose, followed by information from the initial examination in the ER, and finally the results of the post mortem. In the Forensic Toxicology program a three-part case study follows the collection of evidence from a drug related crime scene through a preliminary and confirmatory testing of seized substances followed by a detailed lab report. In the forensic serology and DNA program, three case