

Project title

An Innovative, Media-Driven, Testing Mechanism Integrating Basic and Clinical Sciences

Abstract

Dental education has an obligation to graduate dental practitioners who are competent in the practice of dentistry which includes both cognitive and technical skills. Measurement of this competence occurs in a variety of ways; one of which is performance on National Board Examinations. Accreditation standards state that biomedical science knowledge taught in dental institutions “must be of sufficient depth and scope for medical knowledge and therapies relevant to oral health care”. To adequately accomplish this, testing mechanisms to measure expected outcomes must include facets of both biomedical and clinical science in an integrated testing format to produce a more authentic assessment. In addition, the anticipated use of computer-based examinations facilitates a multimedia approach to testing. The aim of our project is to design an image intensive, innovative, web-based examination that utilizes technology to frame the basic science question in a clinical setting. Test questions will be formatted as clinically correlated testlets using visual and/or auditory presentation enhancing the validity of the assessment as it relates to the practice of dentistry. Students would then be tested in the same format in which they are taught.

As a pilot for the entire board-type examination, we propose to develop an online anatomical sciences (histology, gross anatomy, embryology and neuroanatomy) question test bank that utilizes video clips, digital dissection-based images, and high quality diagrams to enhance and/or supplement the test questions and facilitate testlet-type question development. The web-based test engine will be database driven and easily modified to allow for cross discipline usage (dental and dental hygiene programs). It will be designed for assessing board exam readiness as well as remediation for those re-taking areas of the exam. We propose to collaborate with two other dental schools - one traditional and one non-traditional - and one school of dental hygiene in the development and evaluation of this test engine. Year one of the grant would include the development of the test engine template and the question database including explanations of answers for each question. A video clip, digital image and line drawing database would also be developed to accompany and enhance the clinical relevance of the questions. Testlet questions would integrate all four areas of the anatomical sciences in the clinically-based scenario. Year two is devoted to testing the program at UK and collaborative sites. The student’s performance using the program will be tracked during usage prior to the National Board Examination. A comparison of mean scores between the pretest environment and the past two years’ examinations for each school will be used to assess outcomes as well as subjective information concerning the student satisfaction with the test that will be obtained from a post-test student survey. Year three will be used to modify any shortcomings in the testing format as well as perform statistical analyses and evaluation on the data that has been collected. Based on an anticipated positive outcome of our analyses, we will then begin to initiate discussions with content experts from other disciplines tested on the National Boards on the viability of expanding the question databases to other foundational knowledge disciplines – with an emphasis on integration of these disciplines into the existing testlet questions.

We feel that this image-intensive, discipline-integrative testing format will form the future of computer-based testing in clinical and preclinical standardized examinations.