Web-based Training Tool for Interpreting Dental Radiographic Images
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Abstract
A web-based training tool for interpreting dental radiographic images was developed at University of Wisconsin-Milwaukee (UWM) and evaluated at Marquette University (MU) dental school. The tool provides a self-instructional environment that will simulate the teacher-student interaction in the instruction of the interpretation of dental diagnostic images and allows students to review various abnormalities that the general practitioner may encounter. The training tool also can support off-site instruction and continuing education programs.

Introduction
According to the American Cancer Society’s Survey, 28,900 new cases of oral cancer emerged in 2000. Interpretation of lesions in the jaws, therefore, is a vital professional skill for dental practitioners. There is a real need to enhance radiographic interpretation and diagnosis skills for both dental students and current practitioners. However, dental schools throughout the country are experiencing faculty shortages and lack of faculty reduces the availability of teaching cases and the time allotted for training and assessing students’ skills. This paper presents a novel method for teaching the interpretation of dental diagnostic images utilizing computer-based system.

Methods
A training tool was written in Java on a Window platform. Diagnostic images have been scanned and saved in an Oracle database and can be retrieved and manipulated with a dental image viewer. The tool allows the student to progress through a series of decision making steps which commences with localization of the region of interest and makes decisions regarding the appearance of the periphery, shape, internal structure and effects on surrounding structures of the entity in question. Once this is completed successfully, the student will proceed with a diagnostic algorithm to arrive at a final interpretation. During the interpretation, the training tool provides immediate feedback. To evaluate the effectiveness of the dental radiology training tool, we conducted a pilot study among dental students at Marquette University Dental School in January 2007. We used an adopted Questionnaire for User Interface Satisfaction (QUIS) as the evaluation instrument and recruited thirty-six volunteers to participate in the study.

Results
A prototype system was developed at UWM (see Figure 1 and 2). The client–server architecture of the system allows users from any locations to have access to a dental image archive.

Discussion & Conclusion
Based on the evaluation, the tool has shown the potential to provide a self-instructional environment for undergraduate students either on site or off site and can provide a refresher course for practitioners and could be used in the evaluation of students or practitioners. This will also provide an alternative to lecture based course presentation and simulate a one on one teaching environment.

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