

Enriching the Medical Student Radiology Clerkship: Simulating the Radiologist's Experience

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Background

Current radiology training in medical schools is still predominantly limited to passively observing the radiologist at the workstation and through lectures, textbooks and online sources. Evaluation is also mainly limited on still image interpretation or knowledge-based multiple-choice questions. Furthermore, students may have specific interests based on their choice of residency.

In order to create a tailored and active learning experience, and to evaluate students' ability in image interpretation, we utilized an open-source web-based Picture archiving and communication system (PACS) named "Weasis" and integrated a report system.

Method

We establish a new PACS teaching system by utilizing the open-source PACS system "dcm4chee" and integrating Weasis as imaging viewing browser, MySQL as database and JBOSS as application server. The developmental environment is MyEclipse, developmental language is JAVA. We use WADO (Web Access to Digital Imaging and Communications in Medicine (DICOM) Object) to achieve web-client DICOM images access. Java applets are used via a browser to serve as a DICOM viewer without special software required, and all functions (window width and level, zoom, measurement, etc.) are provided as controls within the server application.

Thus we built a reporting system using the same method for student reporting and preceptor commenting and grading. Following the establishing and implementation of a reporting system using the same way as a plug-in, students can write up very brief reports in the form of impression points.

Figure 1. PACS teaching system flow chart.

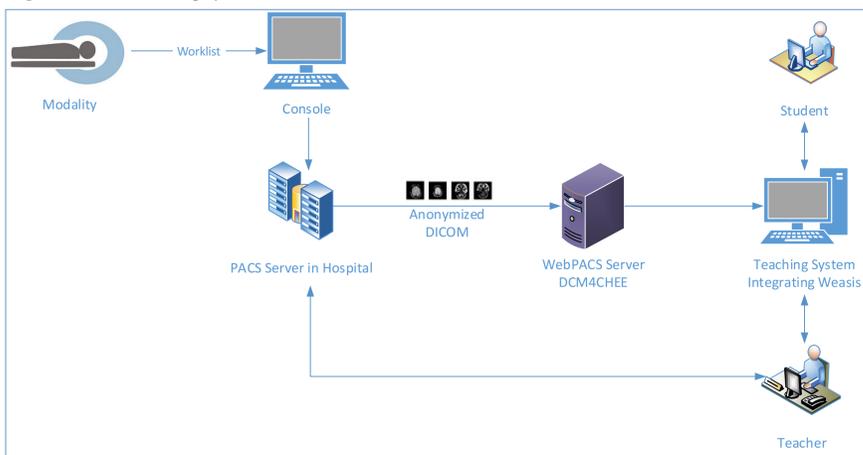


Figure 2. Copy anonymized Hospital PACS image to DCM4CHEE PACS.

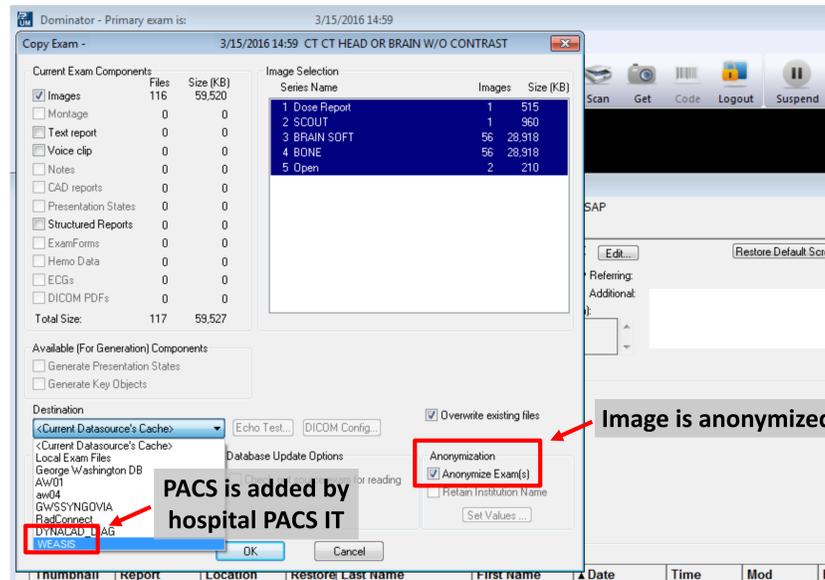


Figure 3. Students view DICOM images and give a brief interpretation

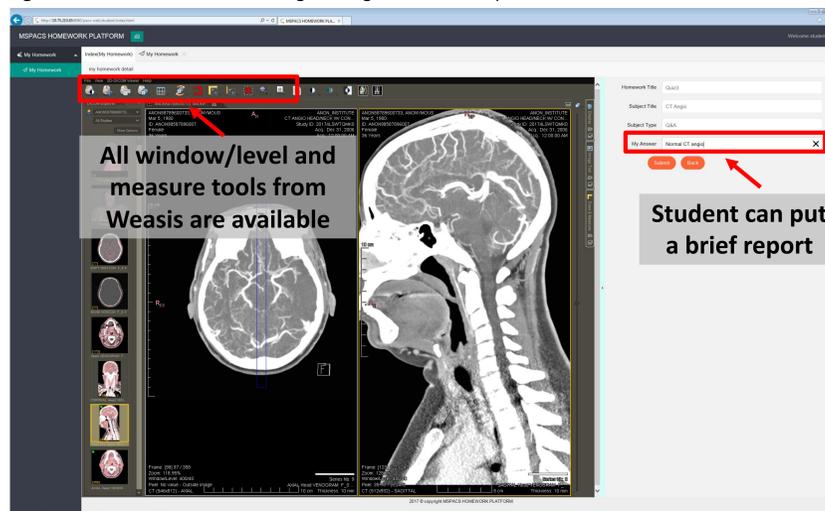
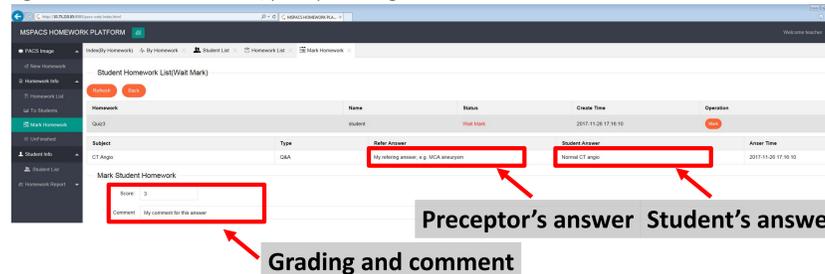


Figure 4. After students submit, preceptor can grade and comment



Results

Attending radiologists can send desired anonymized studies from hospital PACS during read-out to a shared secure server on the hospital network. Cases can then be immediately accessed by trainees on any computer in the hospital. Students, even simultaneously, can simulate being a radiologist and independently formulate an opinion and write up a brief report, without the need for occupying an expensive PACS workstation.

The cases can be categorized into different subspecialties, difficulty levels, and imaging modalities. In addition, this can be also used for examination purposes, both for radiology rotation evaluation of medical students and as part of the pre-call Objective Structured Clinical Examinations (OSCEs) of first year residents.

Conclusions

By implementing Weasis and add-on reporting system, a real-time, easy-access, sophisticated Image Database can be established. for learning, didactic and evaluation purposes. Teaching cases can easily accumulate, thus to provide a new opportunity for both versatile training and evaluation purposes for radiology programs.

Future research will investigate the acceptability, ease of use and possibly the effectiveness for training and education purposes. Already recruiting residents to test using the systems and possibly do prospective cohort research to look for performance comparison between new PACS system training and traditional education.

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