Radiology Teacher: A Free, Internet-Based Radiology Teaching File Server

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Teaching files are an essential ingredient in residency education. The online program Radiology Teacher was developed to allow the creation of interactive and customized teaching files in real time. Online access makes it available anytime and anywhere, and it is free of charge, user tailored, and easy to use. No programming skills, additional plug-ins, or installations are needed, allowing its use even on protected intranets. Special effects for enhancing the learning experience as well as the linking and the source code are created automatically by the program. It may be used in different modes by individuals and institutions to share cases from multiple authors in a single database. Radiology Teacher is an easy-to-use automatic teaching file program that may enhance users' learning experiences by offering different modes of user-defined presentations.

Key Words: E-learning, Web-based, radiology education, teaching files, residents

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INTRODUCTION

The World Wide Web is a rich source of information that offers great potential for new forms of collaboration [1] and can be harnessed for medical education [2]. The Internet allows rapid access to material suitable for radiologic education [3,4]. Its widespread availability, inexpensiveness, accessibility, and ease of use for updating information make the Internet attractive [4]. The growing popularity and increasing importance of the World Wide Web for medical education are part of a multidisciplinary and worldwide trend toward Web-based resources for the public and medical professionals [2,3]. Online medical education offers at least two potential advantages: it is extremely convenient and relatively inexpensive for both educators and students [5].

Radiology education differs from other medical education. In radiology education, learners must be exposed to large amounts of visual information, and the assimilation of these medical images is essential in the training of diagnostic skills [2]. Radiologic images are critical for diagnosis, teaching, and research, and case-based radiologic teaching files are an important component of radiology teaching [2]. Classic teaching files based on printed film images are rapidly becoming obsolete and incompatible with the digital environment of modern radiology departments [6,7]. Although teaching files are common in radiology and there is an increasing role of digital technology in radiology departments, today's teaching files have not yet seen the widespread application of this new technology. One of several reasons might be fear of the initial setup and maintenance costs for a department to run its own teaching file server [8]. Such departments would be more willing to create digital teaching files if there were a cost-efficient or free way of doing so. Furthermore, there are various radiologic teaching sites that provide a large number of images and content of variable quality [4]. Most of the Web sites are static and not able to accommodate individual users' needs. Accordingly, a strategy is needed to satisfy these learners' needs. This new Web site strategy should empower educators with a solution for creating interactive educational content and hosting that content within the educators' personalized and protected educational sites on the Web, thus providing a valuable outlet that can magnify the impact of educators' talents and contributions [9]. In this article, I describe Radiology Teacher: a free, Web-based teaching file development and distribution program that demonstrates a solution to satisfy learners' needs and faces the economic and logistic limitations of radiology departments.

PROGRAM DESCRIPTION

Radiology Teacher allows users to create Web-based teaching files for presentations and teaching purposes. It

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is available on the Web at http://www.radiologyteacher.com and thus accessible worldwide from every computer with an Internet connection. Special effects for enhancing the learning experience as well as the linking and the source code are created automatically by the program. The resulting Web site is immediately available worldwide on the Internet. Authors can change teaching files at any time, and the changes will be made on the fly. There is no need for a file transfer after each change. The program can be tailored for individual authors' needs as well as for residency programs.

Radiology Teacher is divided into several areas: the case, image, case list, quiz, preference, case menu, search, and viewing areas.

Case, Image, and Preview Areas

The case and image areas allow authors to create, edit, and delete cases and to save and delete their images with descriptions. Free text entry is possible, and predefined categories are offered to reduce manual entry errors and to improve the categorization and searchability of cases later on. Users may enter and edit text and upload and delete images at any time with instant results. Automatic reminders make users aware of missed fields. Authors may also indicate whether the created teaching files should be made available to the public, only selected groups, or only the authors themselves. Authors can always track case histories—when cases were created and when the last updates were made.

The image area allows authors to make individual changes to images to enhance their appearance, including deidentification and annotations. Most common image formats are allowed for image upload (eg, Joint Photographic Experts Group [.jpg], portable network graphics [.png], bitmap [.bmp], tagged image file format [.tif], Digital Imaging and Communications in Medicine (DICOM)) and are converted on the server side into browser-compatible formats. The viewer menu provides a quick preview of an edited case without leaving the editor itself (Figure 1). Radiology Teacher provides authors with a variety of viewing templates, and with one mouse click, an author and user may view cases in different styles. In the case menu, cases are ordered chronologically by entry date and can be quickly accessed.

Case List and Quiz Areas

The case list area allows the creation of individual case lists for morning conferences, private seminars, or public teaching. Authors can add each individual case to a specific case list. The status of a case list can be changed to be made accessible to the public, only specific groups, or only authors themselves. Case lists can be edited at any time, including titles, descriptions, and status, and cases can be added and deleted from the lists.

In the quiz edit area, authors can create quizzes related to individual cases. Up to 5 answer choices with an explanation for each question may be added. The quiz feature will be also available for the case lists. It is currently in its beta phase and not yet available to the public.

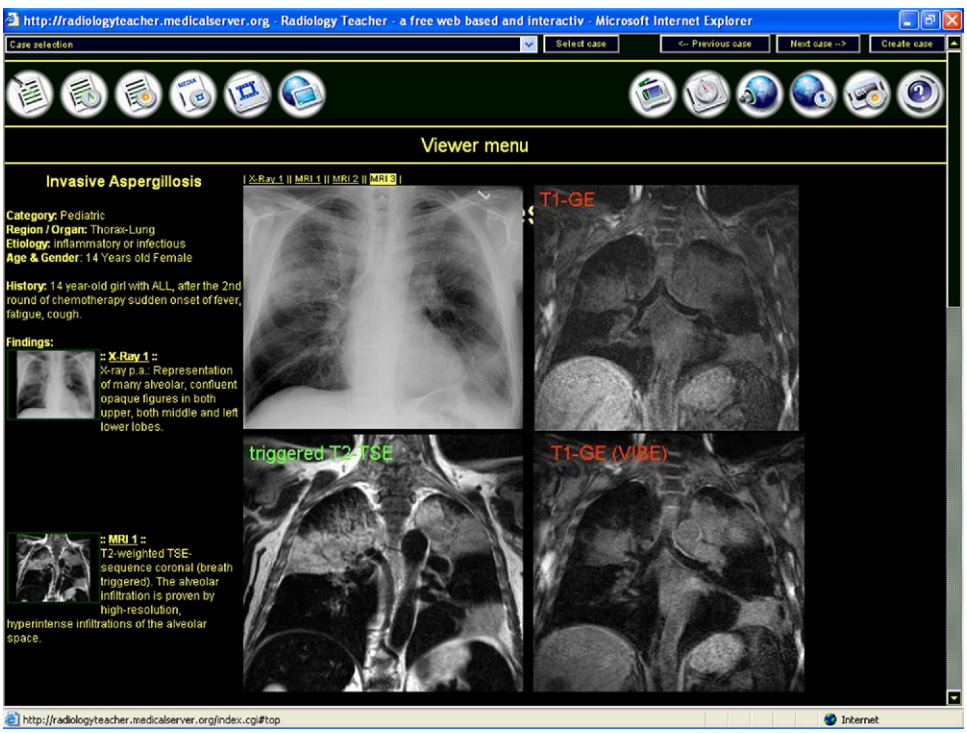

Fig 1. Screenshot of the case preview. This area provides a quick preview of the edited case without the need to leave the editor itself.