

Moodle for e-Learning: A how to tutorial and practical example of radiation protection teaching

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www.myESR.org

Learning objectives

To provide a tutorial for the less-experienced computer users to understand how to utilise Moodle as an instruction medium for radiation protection teaching for medical students

Background

Article 7 from 97/43/Euratom Directive that states that Member States shall encourage the introduction of a course on radiation protection in the basic curriculum of medical schools. Traditionally, radiation protection teaching is limited to radiologists and radiographers. With ever increasing knowledge and time constraints on medical students, we need to look for alternative medium of instruction that is effective in cost and outcome. Moodle, a Course Management System (CMS) is a free web application that educators can use to create effective online learning sites. Moodle has the potential to deliver flexible and user-oriented teaching. Many institutions use it as their platform to conduct fully online courses or as part of a blended learning experience.

Imaging findings OR Procedure details

Step 1:

Install and configure Moodle.

This step may be forsaken if moodle was installed by your system administrator or webmaster. However, you may choose to read through this section as the configuration of Moodle will affect the teacher - learner experience.

1. Web server

There are a variety of web hosts that offer Moodle on servers that cost less than \$10 a month. Shop around to get a good bargain. The factors you want to consider are - disc space (what type of material you are including eg. Videos, audios, or plain text), bandwidth (related to above and number of students also).

1. Getting Moodle

It can be found from the official website <http://www.moodle.org> on the download page. Selecting the latest Stable branch is usually the best option. This will require decompression using a program such as WinZip and subsequent uploading onto server using Macromedia.

2. The moodle data directory

When installing Moodle, you will need to choose a directory to store Moodle itself (i.e. the program that runs your course) and the data (i.e. the course material you will upload for your site later). The latter should be readable and writable by the web server but not accessible directly via the web.

3. Creating moodle database

The moodle database stores files uploaded (eg. Assignments) by your students. Change from the default database name moodle and username moodleuser to something else to avoid hackers from destroying your hard work! This can be done using the control panel > MySQL database on your server menu. The user will need to have the following features enabled : SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, INDEX, and ALTER.

4. The installer script

In your moodle directory, there is a script called install.php which creates the moodle configuration file config.php when it is run. You can run install.php using your web browser. The first part asks you to configure the database where most Moodle data will be stored - type (MySQL), Host server, database name, database user name and password, and table prefix (table is essentially a database within a database, and is usually given a mdl_ prefix). Moodle then proceeds to create the database tables with no further steps.

5. Site variables

After creating database tables, we need to specify the site variables. This allows you to select the default language for the site, and offer the course content in multiple languages. This will also determine the appropriate display of time and date. There are a few other settings you may wish to consider at this stage or return later:

- Maximum time students are enrolled in course (default 1000 days)
- No reply address (email to course students where no individual replies wanted)

- Max Editing time (time between posting / entry and when it is actually published online)
- Delete unconfirmed (length of time to respond to authentication email)
- Log life time (length of time of log of activities on your site to be kept eg. 30 days)
- Log in failures (to monitor security on website)
- Proxyhost and proxyport (only if running from college network, ask network admin in your institution for these details)
- Auto Login Guest (allows guest access to your course)
- Max bytes (Maximum size of files such as assignments that can be uploaded to server)
- Open to Google (Allows indexing of your site on google)
- Enable RSS feeds (Supply selected content to rest of world)
- and many more features can be configured

6. Site settings

After creating the tables, you are brought to the Site Settings page. This will allow you to configure the appearance of your sites front page. You can also change the content of this page again at a later stage.

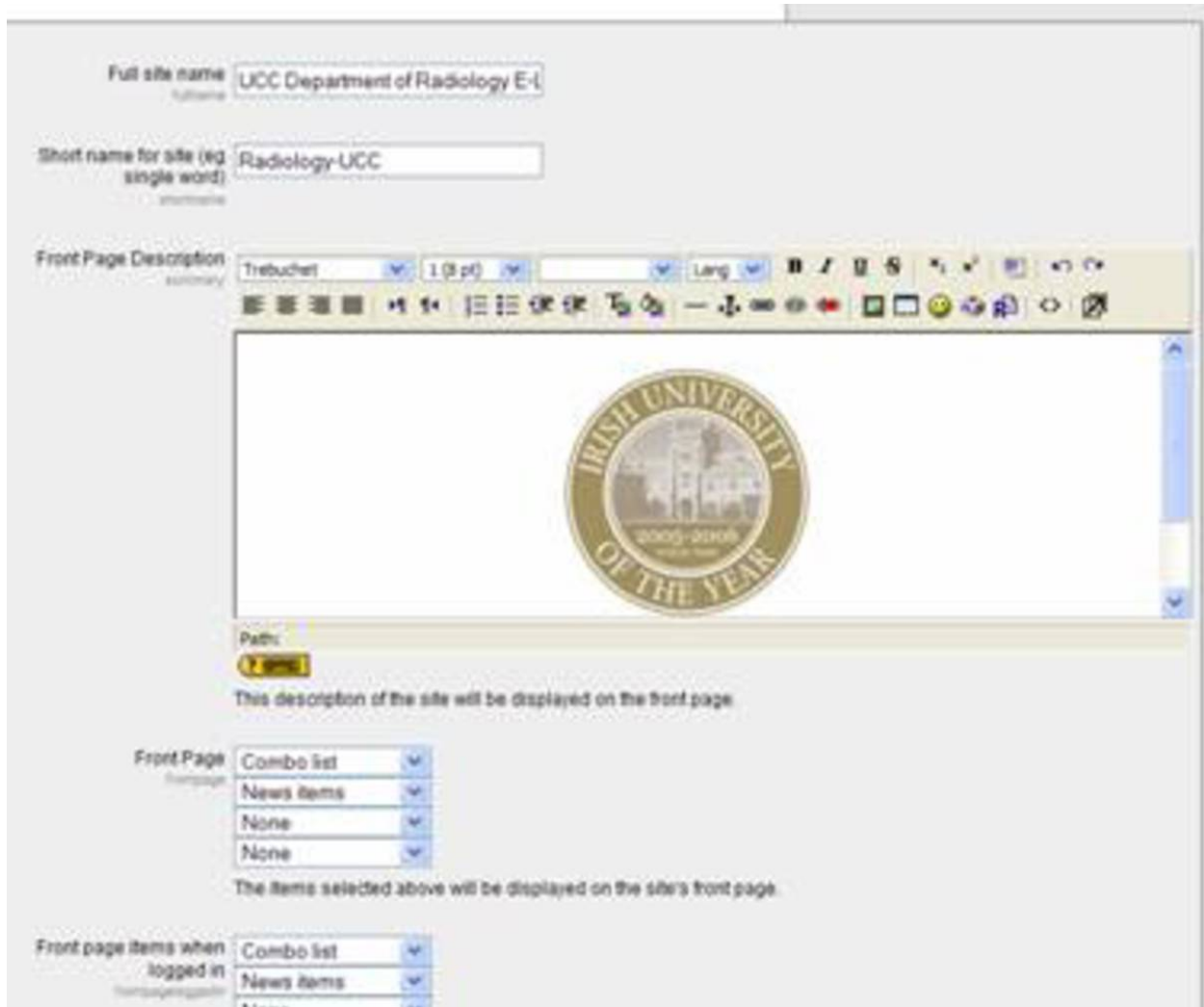
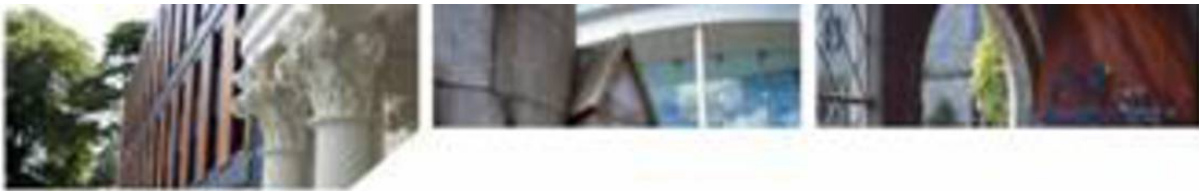


Fig.: Setting the Name and Logo of the Front page

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

Front page format: (you can choose any form you like - go ahead and experiment!)

1. Summary of section



Radiology-UCC > Edit section 1

Summary of section 1

Summary:


Trebuchet | 1 (8 pt) | Normal | Lang

About these summaries
About the HTML editor

This Site is the UCC Department of Radiology's Online Educational Website.

The site is built on a powerful Open Source Framework which facilitates the delivery of Online Educational Content by Multiple Teachers in various Electronic Formats including -

- Simple Page Based Tutorials
- Pictorial Cases
- Powerpoint Presentations
- MCQ's with Online Marking/Correction
- Clinical Case Scenarios
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- Videocasts + many more...



The Site may be Updated by an unlimited number of Registered Teachers. Creating a Course or Tutorial is as simple as composing an Email in its most basic form.

Building Advanced Courses with Questions, Answers and Interactive Media is an intuitive

Path: bold = **b** = strong

2 min

Save changes

Fig.: Summary of your website

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

2. Course categories - if you decide to show a list of the courses you can do so, and it will look like this.

Course categories



Fig.: Example of course categories for radiation protection

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

The next step is enrolling students onto your course. Internal enrolment is the default form of enrolment. A teacher or administrator selects students from within the course and the prospective student is supplied with an enrolment key. This key allows student to enroll in the course.

Step 2:

Creating Categories and Courses

1. You can create course categories under Administration > Course categories screen as shown below.

Radiology-UCC > Administration > Courses > Add/edit courses

Blocks editing off Turn editing off

Site Administration
 Assign roles

Notifications
 Closed folder Users
 Opened folder Courses
 Add/edit courses
 Enrolments
 Course default settings
 Course request
 Backups
 Closed folder Grades
 Closed folder Location
 Closed folder Language
 Closed folder Modules
 Closed folder Security
 Closed folder Appearance
 Closed folder Front Page
 Closed folder Server
 Closed folder Networking
 Closed folder Reports
 Closed folder Miscellaneous

Admin bookmarks
 Assign roles

[bookmark this page](#)

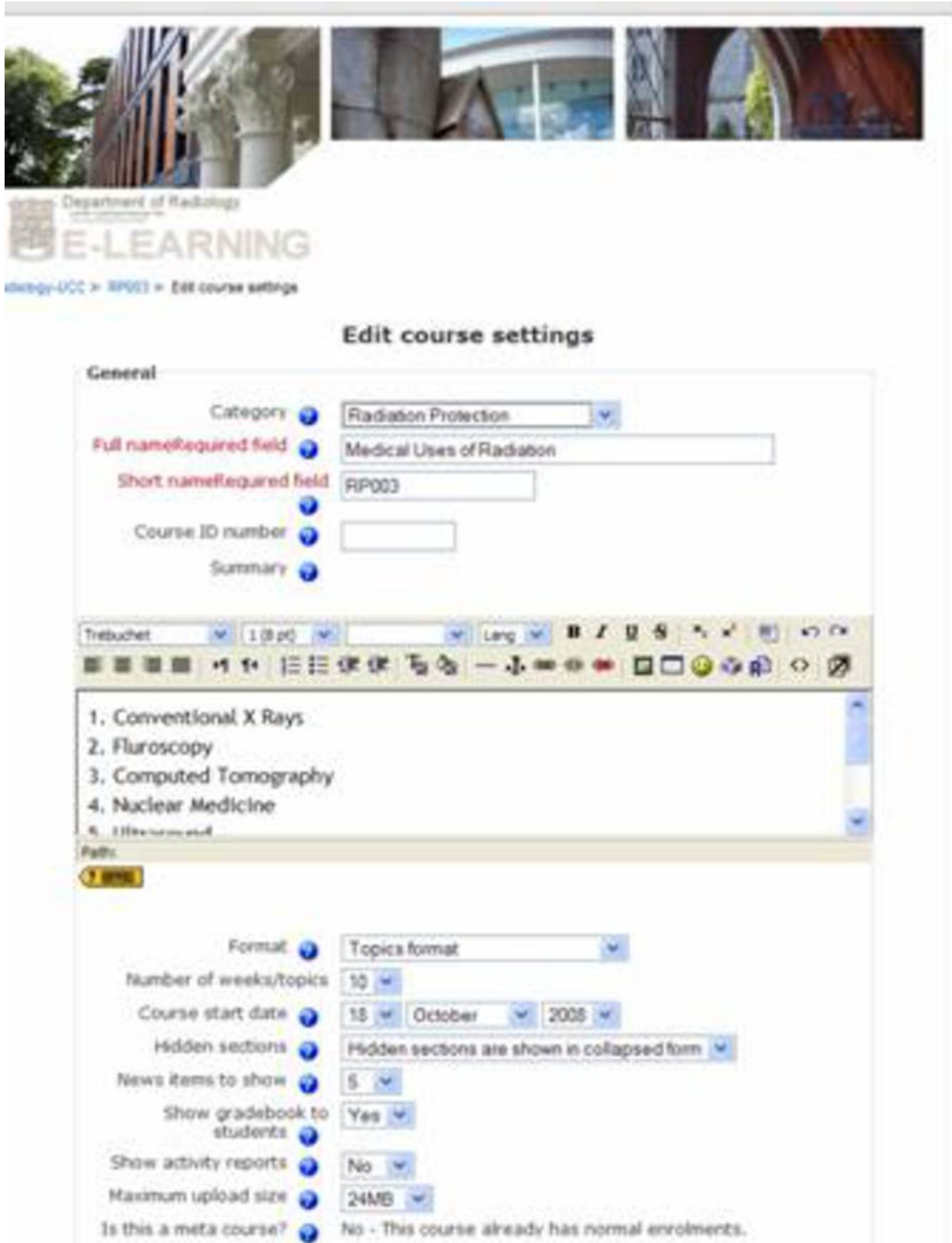
Course categories

Course categories	Courses	Edit	Move category to:
Radiation Protection	9		Top <input type="button" value="v"/>
Case of the Week	1		Top <input type="button" value="v"/>
Plain Film	2		Top <input type="button" value="v"/>
Computed Tomography	0		Top <input type="button" value="v"/>
Nuclear Medicine	0		Top <input type="button" value="v"/>
Ultrasound	0		Top <input type="button" value="v"/>
Magnetic Resonance Imaging	1		Top <input type="button" value="v"/>
Interventional Radiology	0		Top <input type="button" value="v"/>

Fig.: Creating a new course or course category

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

If you select add a new course, the following page will appear.



Department of Radiology
E-LEARNING

radiology-UCC > RP003 > Edit course settings

Edit course settings

General

Category: Radiation Protection

Full name (required field): Medical Uses of Radiation

Short name (required field): RP003

Course ID number:

Summary:

Trebuchet 1 (8 pt) Lang

1. Conventional X Rays
2. Fluoroscopy
3. Computed Tomography
4. Nuclear Medicine
5. Ultrasound

Path:

Format: Topics format

Number of weeks/topics: 10

Course start date: 15 October 2008

Hidden sections: Hidden sections are shown in collapsed form

News items to show: 5

Show gradebook to students: Yes

Show activity reports: No

Maximum upload size: 24MB

Is this a meta course?: No - This course already has normal enrolments.

Fig.: Creating a new course

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

There are a variety of settings that you will need to determine including format (social - which is forum like, or topic - which organized into topics/activities and students are encouraged to proceed sequentially), course start date, enrolment period, number of topics/week, adding/removing sections, enrolment key, guest access etc. You can allow the default to run, and change these later after you experiment logging on as a student.

You can add a quick summary of the course in the text box as in the image above.

Once you click create course, then the following page will appear, requiring you to define who will play the various roles in your course.

Department of Radiology
E-LEARNING

Radiology-UCC > CT001 > Roles

Locally assigned roles Override permissions

Assign roles in Course: CT001 ?

Roles	Description	Users
Administrator	Administrators can usually do anything on the site, in all courses.	0
Course creator	Course creators can create new courses and teach in them.	0
Teacher	Teachers can do anything within a course, including changing the activities and grading students.	0
Non-editing teacher	Non-editing teachers can teach in courses and grade students, but may not alter activities.	0
Student	Students generally have less privileges within a course.	0
Guest	Guests have minimal privileges and usually can not enter text anywhere.	0
Authenticated user	All logged in users.	0

[Click here to enter your course](#)

Fig.: Assigning role of students/teachers in the course

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

Once you have set that up, click to enter your course.

This will bring you to the following page, where you click on add a resource, which will bring the following drop down menu.



Weekly outline

News forum

- Add a resource... (selected)
- Add a resource...
- Insert a label
- Compose a text page
- Compose a web page
- Link to a file or web site
- Display a directory
- Add an IMS Content Package

Add an activity...

8 February - 14 February

15 February - 21 February

22 February - 28 February

1 March - 7 March

8 March - 14 March

15 March - 21 March

Latest News

Assign roles

Add a new topic...
(No news has been posted yet)

Upcoming Events

Assign roles

There are no upcoming events

Go to calendar...
New Event...

Recent Activity

Assign roles

Activity since Friday, 22 January 2010, 01:16 PM
Full report of recent activity...

Nothing new since your last login

Blocks

Add...

Fig.: Adding a resource using the drop down menu

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

For the purposes of illustration, we will click on compose a web page.

The following page will appear, where you can easily enter information regarding your course and insert course material into the boxes as above. If you are not sure what to do, clicking on the blue circled question mark will give a brief explanation, and just putting the cursor over the symbol will tell you what function it has. If you are still unsure, just experiment!



Adding a new Resource to week 1

General

Name Required field

Summary

Trebuchet 1 (8 pt) Lang **B I U S**

Path:

Compose a web page

Full text required field

Trebuchet 1 (8 pt) Lang **B I U S**

Fig.: Composing a webpage for your course and entering a summary

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

Once you are happy, with material you entered, you can either save and return to course which will look something like this.



Topic outline

News forum → [edit] [delete] [lock] [unlock]

Conventional X Rays and Fluoroscopy → [edit] [delete] [lock] [unlock]

1 Computed Tomography → [edit] [delete] [lock] [unlock]

2 Nuclear Medicine → [edit] [delete] [lock] [unlock]

3 Ultrasound → [edit] [delete] [lock] [unlock]

4 Magnetic Resonance Imaging → [edit] [delete] [lock] [unlock]

5 PET scan → [edit] [delete] [lock] [unlock]

[Add a resource...] [Add an activity...]

Latest News
Assign roles [lock] [unlock] [delete] [refresh]

Add a new topic...
(No news has been posted yet)

Upcoming Events
Assign roles [lock] [unlock] [delete] [refresh]

There are no upcoming events

Go to calendar...
New Event...

Recent Activity
Assign roles [lock] [unlock] [delete] [refresh]

Activity since Friday, 22 January 2010, 01:23 PM
Full report of recent activity...

Nothing new since your last login

Blocks
Add...

Fig.: Course in edit mode

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND

Alternatively, save and display to see how it looks like.

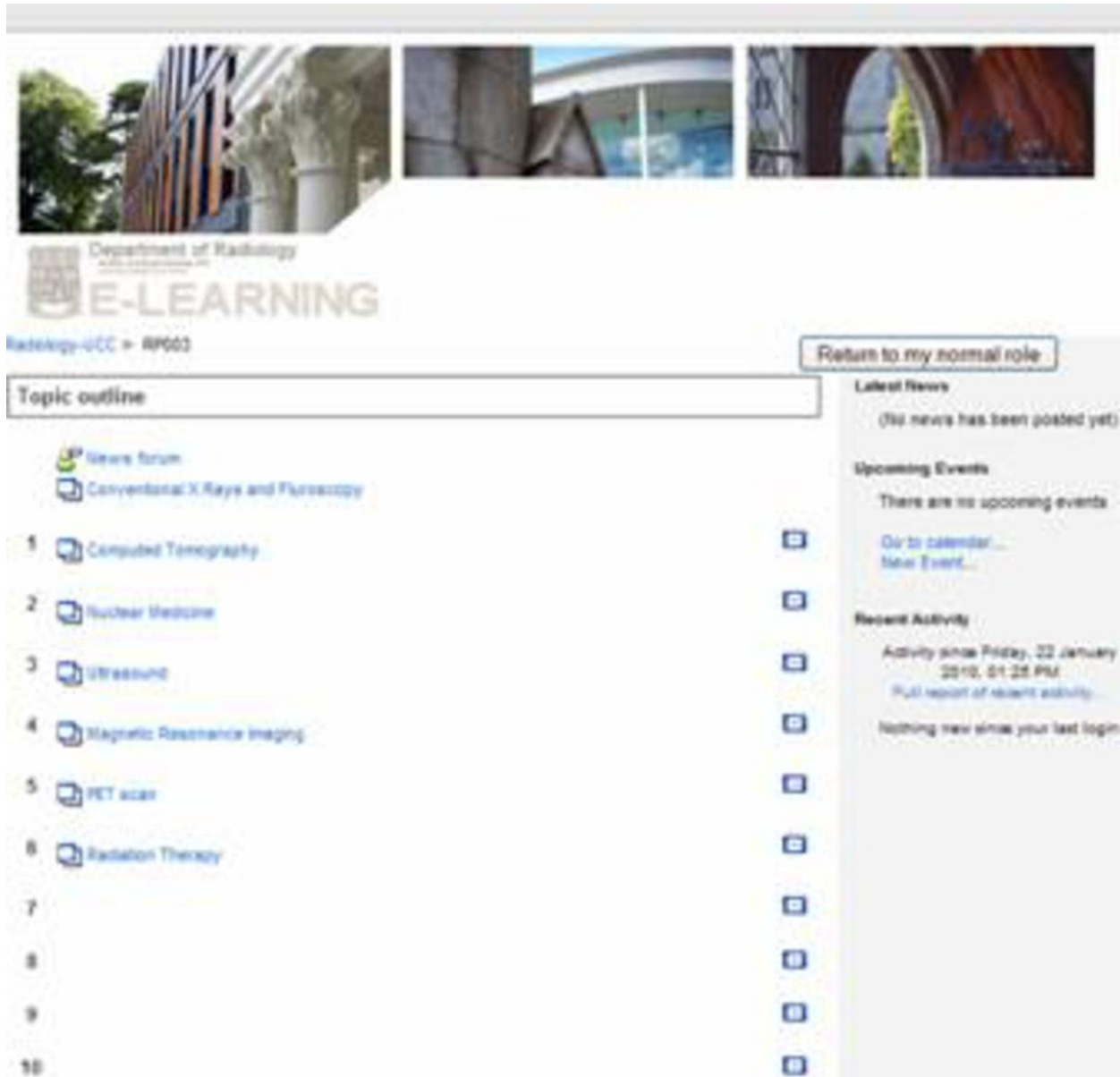


Fig.: Menu page as seen by the students

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND



Always remember the benefits of using X-rays

All the methods of medical imaging can bring very real benefits to patients. Your job is to ensure that when radiation is used, the benefits from making the right diagnosis, and consequently giving you the right treatment, outweigh any small risk involved.

Patients may still be concerned about the possible risks from having an X-ray examination, and you can explain to the patient how the information gained will help to improve their treatment. If treatment decisions depend on the findings, then the risk to the patient from not having the examination is likely to be much greater than that from the radiation itself.

MEDICAL USES OF RADIATION

Conventional X Rays

This is the familiar X-ray where a beam of x-rays produced by an x-ray machine is directed at the part of your body that is being examined and on to a special film (or digital cassette) to make a picture.



Source: WOOD

Fig.: Sample page from the radiation protection module

References: S. Leong; Radiology, Cork University Hospital, Cork, IRELAND
Congratulations! You have successfully created your first Moodle course!

From here, you can go on and add more interactivity into your course such as:

1. Assignments
2. Choice (Single question)
3. Journal
4. Quiz
5. Survey

Adding these materials are beyond the scope of this poster, but you can obtain more information from the moodle.org website which is free!

Images for this section:

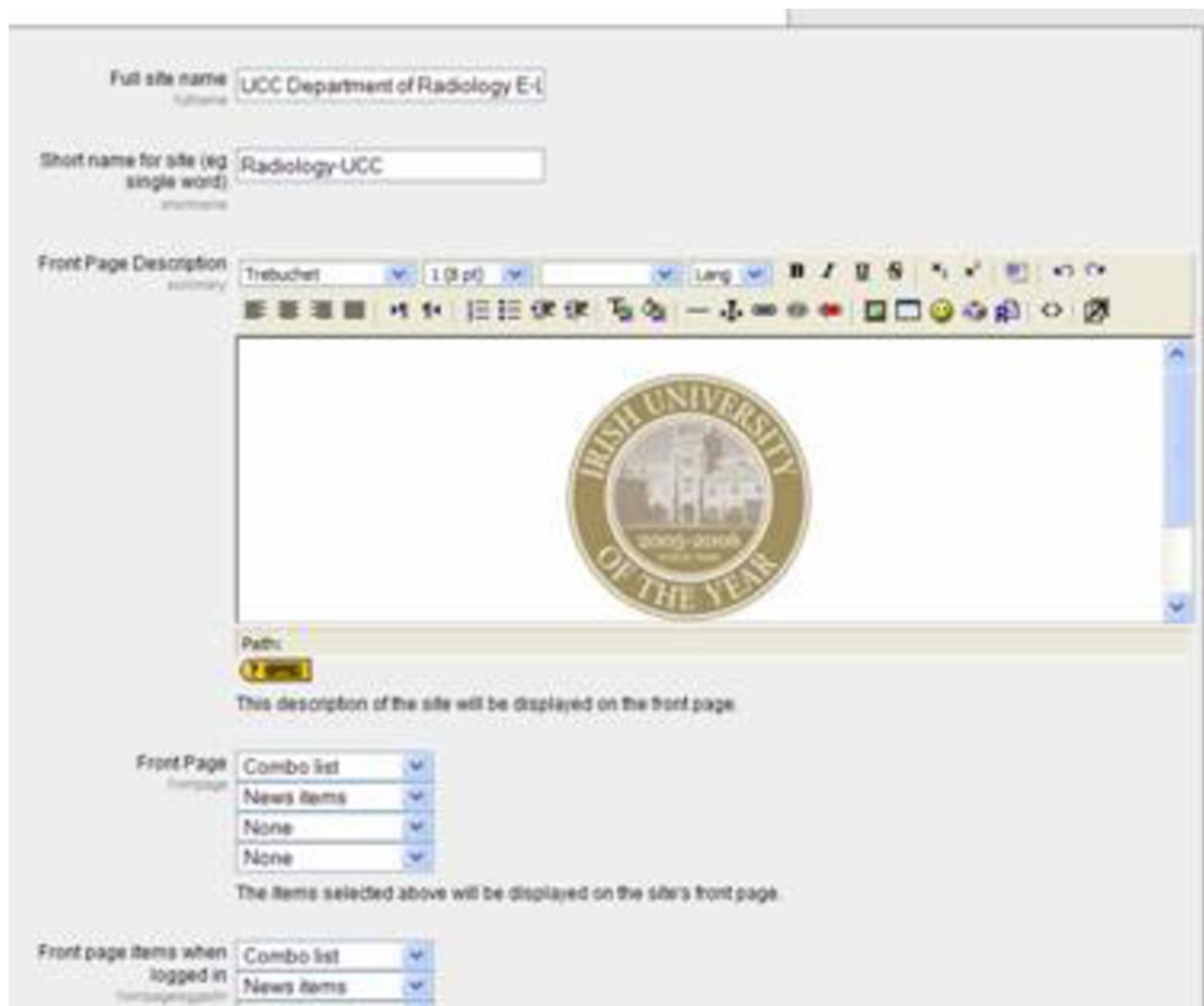
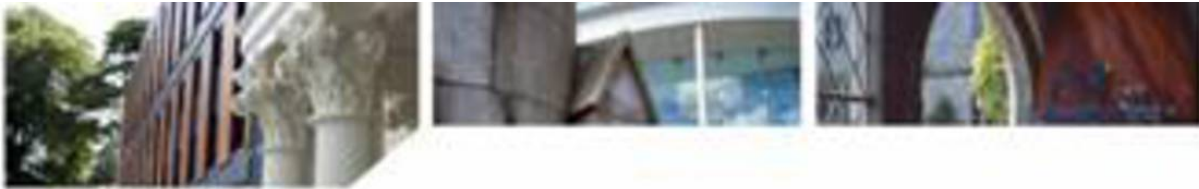


Fig. 1: Setting the Name and Logo of the Front page



Summary of section 1

Summary:

About these summaries

About the HTML editor

Trebuchet 18 pt Normal Lang

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Path: bold = p = strong

Save changes

Fig. 2: Summary of your website

Course categories

 Radiation Protection	
Welcome	
Introduction to the Basics of Radiation Protection	 
Medical Uses of Radiation	 
Staff in the Radiology Department	 
Cellular Effects of Radiation	 
Dosimetry and Risk	 
Personal Protection	 
Requesting a Radiological Examination	 
Radiation Protection Legislation	 
 Case of the Week	
20th October 2008	
 Plain Film	
Chest X Ray Tutorial	  

Fig. 3: Example of course categories for radiation protection

Radiology-UCC > Administration > Courses > Add/edit courses

Blocks editing off Turn editing off

Site Administration
 Assign roles
 Notifications
 Closed folder Users
 Opened folder Courses
 Add/edit courses
 Enrolments
 Course default settings
 Course request
 Backups
 Closed folder Grades
 Closed folder Location
 Closed folder Language
 Closed folder Modules
 Closed folder Security
 Closed folder Appearance
 Closed folder Front Page
 Closed folder Server
 Closed folder Networking
 Closed folder Reports
 Closed folder Miscellaneous

Course categories

Course categories	Courses	Edit	Move category to:
Radiation Protection	9	[edit] [delete] [add]	Top
Case of the Week	1	[edit] [delete] [add]	Top
Plain Film	2	[edit] [delete] [add]	Top
Computed Tomography	0	[edit] [delete] [add]	Top
Nuclear Medicine	0	[edit] [delete] [add]	Top
Ultrasound	0	[edit] [delete] [add]	Top
Magnetic Resonance Imaging	1	[edit] [delete] [add]	Top
Interventional Radiology	0	[edit] [delete] [add]	Top

Add a new course Add new category

Fig. 4: Creating a new course or course category

Department of Radiology
E-LEARNING

radiology-UCC > RP003 > Edit course settings

Edit course settings

General

Category: Radiation Protection

Full name (required field): Medical Uses of Radiation

Short name (required field): RP003

Course ID number: []

Summary: []

Trebuchet | 1 (8 pt) | Lang

1. Conventional X Rays
2. Fluoroscopy
3. Computed Tomography
4. Nuclear Medicine
5. []

Path: []

Format

Format: Topics format

Number of weeks/topics: 10

Course start date: 15 October 2008

Hidden sections: Hidden sections are shown in collapsed form

News items to show: 5

Show gradebook to students: Yes

Show activity reports: No

Maximum upload size: 24MB

Is this a meta course? No - This course already has normal enrolments.

Fig. 5: Creating a new course



Department of Radiology

E-LEARNING

Radiology-UCC > CT001 > Roles

Locally assigned roles

Override permissions

Assign roles in Course: CT001 ?

Roles	Description	Users
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Authenticated user	All logged in users.	0

[Click here to enter your course](#)

Fig. 6: Assigning role of students/teachers in the course



Weekly outline

News forum

- Add a resource... (dropdown menu open)
- Add an activity...

25 February - 1 March

- Insert a label
- Compose a text page
- Compose a web page
- Link to a file or web site
- Display a directory
- Add an IMS Content Package

8 February - 14 February

- Add a resource...
- Add an activity...

15 February - 21 February

- Add a resource...
- Add an activity...

22 February - 28 February

- Add a resource...
- Add an activity...

1 March - 7 March

- Add a resource...
- Add an activity...

8 March - 14 March

- Add a resource...
- Add an activity...

15 March - 21 March

- Add a resource...
- Add an activity...

Latest News

Assign roles

Add a new topic...
(No news has been posted yet)

Upcoming Events

Assign roles

There are no upcoming events

Go to calendar...
New Event...

Recent Activity

Assign roles

Activity since Friday, 22 January 2010, 01:16 PM
Full report of recent activity...

Nothing new since your last login

Blocks

Add...

Fig. 7: Adding a resource using the drop down menu



Adding a new Resource to week 1

General

Name **Required field**

Summary

Trebuchet 1 (8 pt) Lang **B I U S**

Path:

Compose a web page

Full text **Required field**

Trebuchet 1 (8 pt) Lang **B I U S**

Fig. 8: Composing a webpage for your course and entering a summary

The screenshot displays a Moodle course page for the Department of Radiology. At the top, there are three images of a building facade. Below them is the department logo and the text "Department of Radiology" and "E-LEARNING". The course ID is "Radiology-UCC > RP003". The page is in "editing" mode, as indicated by the "Turn editing off" button in the top right. The main content area is titled "Topic outline" and lists five topics, each with a "Add a resource..." and "Add an activity..." dropdown menu. The topics are: "Conventional X Rays and Fluoroscopy", "Computed Tomography", "Nuclear Medicine", "Ultrasound", and "Magnetic Resonance Imaging". The right sidebar contains several sections: "Latest News" (no news posted yet), "Upcoming Events" (no events), "Recent Activity" (activity since Friday, 22 January 2010, 01:23 PM), and "Blocks" (Add...). The bottom of the page is a solid red bar with the text "Page 27 of 30" and "European Society of Radiology | www.myESR.org".

Fig. 9: Course in edit mode

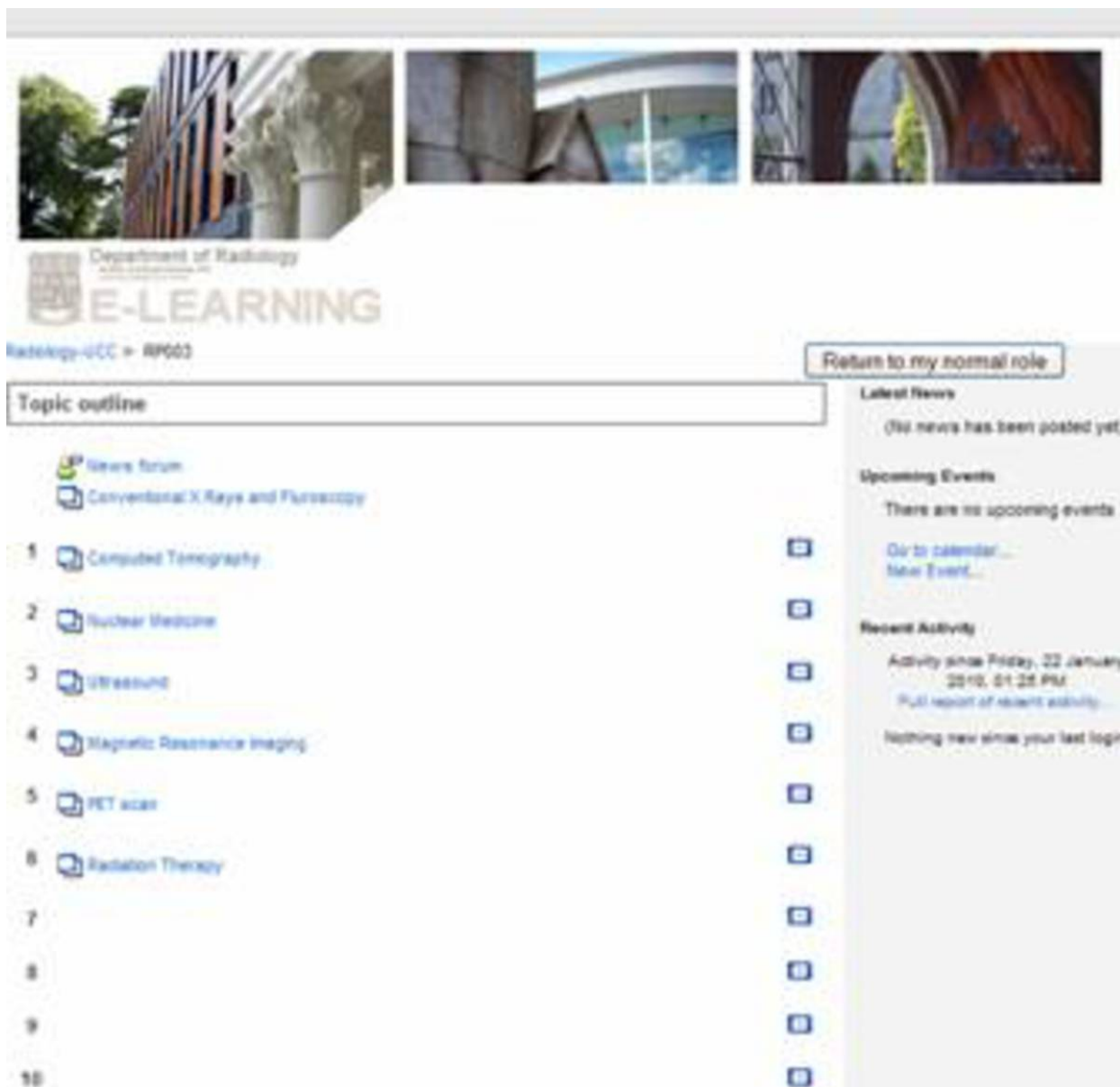


Fig. 10: Menu page as seen by the students



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Source: WOOD

Fig. 11: Sample page from the radiation protection module

Conclusion

This tutorial explains in a non-jargonic way how Moodle can provide an e-Learning interface for Radiation Protection to medical students.

Personal Information

References

1. <http://moodle.org>
2. <http://en.wikipedia.org>
3. Moodle E-Learning Course Development: A complete guide to successful learning using Moodle. William Rice. ISBN-13: 978-1904811299