Evaluation of e-learning platforms

mSysTech

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1 INTRODUCTION

In consideration of the shortage of engineers in the range of micro–nano–systems and the decrease of students in the electronic field at the universities in Romania and Bulgaria the project “E-Training Microsystems Technologies" (mSysTech) was launched and should improve the competitiveness of these countries’ universities within Europe.

Based on a corporate-used platform, the possibility of communication without further ado should be given to training organisations, professionals from SME[1] in electronics, universities and vocational training schools. Up-to-date courses, elected content, simulations and demonstrations will be used in the most effective way to prepare the technicians to be for their future professions.

This documentation will give you a review of already existing e-learning platforms with all their characteristics, advantages and disadvantages and contains a comparison between the different systems. A slight tendency towards “moodle” prevails and the maintenance of the yet existing platform “NanoTrain” has been taken into account. At the end the most convenient platform for the mSysTech proposal to be chosen is recommended.

2 REQUIREMENTS

2.1 Technical requirements

Altogether the e-learning platform should exhibit low technical complexity for students, teachers and administrators and ought to be a web-based solution. For an easier technical migration the preferred platform’s requirements are the programming language PHP, the database MySQL and the Apache web server.

2.2 Financial requirements

An Open Source Software and a free or at least inexpensive web hosting should be opted ideally. In case of a required software enhancement the access to the source code would be also helpful.

2.3 Functional requirements

Considering the fact that several countries with dissimilar mother tongues are involved in the project, the administration and the course handling should to be multi-lingual and support all languages spoken by the mSysTech partners. Those are English (EN), French (FR), German (DE), Bulgarian (BG) and Romanian (RO).
The support of the Cyrillic alphabet and UTF-8 is as necessary a role-based administration system (at least “administrator”, “teacher”/ “tutor” and “student”).
A comfortable dealing with the e-learning system should encourage users to share in. Therefore a user-friendly and clear interface is indispensable. An HTML editor should facilitate the input of the content. The flexible learning contents should include multiple

[1] Small and medium enterprises

choice questions, automatically corrected by the system and consequently assure the successful learning progress of the students.

Since the field of study and its teaching content is very technological, the system needs to have the ability of displaying complex mathematical formulas.

In addition, embedding of interactive and multimedia content (e. g. videos, Flash or Java applets etc.) must be possible.

Several project-management-tools like a board for announcements, a secured section to upload documents, data export (e. g. to XML) and data import (MS Word or PDF etc.) are important features and ought to be covered as well.

2.4 Miscellaneous requirements

The purpose of a user-friendly platform fitted to the needs of an academic environment is preferable.

Beyond, an established community would be very administrable for reasons of maintenance, technical support and additional features.

3 OVERVIEW AND PRESELECTING

3.1 Review of current e-learning platforms

The current Learning Management System (LMS) market offers various e-learning platforms, with differing advantages and disadvantages. To encircle the large range, 24 e-learning systems were picked and tested in relation to their technical and financial requirements and the languages featured. A free e-learning system with the technical requirements of supporting Apache, MySql and PHP and the diverse Partner's languages is desired. The following chart will give you a review of the selected e-learning systems and provides a first pre-selection.

Name (URL)	System requirements	Price / License	Multi-lingual
.LRN (http://dotlrn.org/)	UNIX / Linux	Open Source / GNU GPL	EN, ES, DE
AnaXagora – LCMS (http://www.anaxagora.lu/)	Apache Tomcat 4, MySQL 4.1, PHP 4, Linux / Windows	Open Source / GNU GPL	EN, FR
AngelLearning (http://www.angellearning.com/)	Not disclosed	Commercial	Not disclosed
ATutor (http://www.atutor.ca/)	XAMP-Software	Open Source / GNU GPL	All, included EN, FR, DE, BG, RO
Blackboard (http://www.blackboard.com/)	Not disclosed	Depends on licence (5000US$(and upwards) /server/p.a.)	Not disclosed
Claroline (http://www.claroline.net/)	XAMP-Software	Open Source/ GPL	35 languages, included EN, FR, DE, BG, RO
Desire2Learn (http://www.desire2learn.com/)	Not disclosed	Commercial	Not disclosed

Name (URL)	System requirements	Price / License	Multi-lingual
Docebo (http://www.docebo.org/)	XAMP-Software	Open Source / GPL 2.0	17 languages, excluded BG, RO
Dokeos (http://www.dokeos.com/)	XAMP-Software	Open Source / GPL 2.0	34 languages, included EN, FR, DE, BG, RO
eCollege (http://www.ecollege.com)	Not disclosed	Commercial	Not disclosed
eFront (http://www.efrontlearning.net/)	XAMP-Software	Open Source / CPAL	24 languages, included EN, DE, ES; BG, RO, FR (Machine translation)
Fle3 (http://fle3.uiah.fi/)	Zope, Python 2.3.x	Open Source / GPL	20 languages, which is not disclosed
Ganesha (http://ganesha.fr/)	PHP, MySQL	Open Source / GPL	EN, FR
Ilias (http://www.ilias.de/)	XAMP-Software	Open Source / GNU GPL	22 languages, included EN, FR, DE, BG, RO
It's learning (http://www.itslearning.com/)	ASP.NET	Commercial	EN, ES, NO, NL, DA, SV
Learn.com (http://www.learn.com/)	Not disclosed	Commercial	Not disclosed
LON-CAPA (http://www.lon-capa.org/)	Linux, Apache, MySQL	Open Source / GNU GPL	Not disclosed
Moodle (http://moodle.org/)	XAMP-Software,	Open Source / GNU GPL	78 languages, included EN, FR, DE, BG, RO
Nano-Train (http://nano-train.com/)	XAMP-Software	-	EN, FR, DE, BG, (RO)
OLAT (http://www.olat.org/)	Java, Linux, Apache2.0	Open Source	24 languages, excluded BG, RO

Name (URL)	System requirements	Price / License	Multi-lingual
Prométhée (http://promethee.eu.org/)	XAMP-Software	Open Source / GNU GPL	EN, FR, ES
Sakai (http://sakaiproject.org/)	Java, Apache Tomcat	Open Source / ECL	EN
SyberWorks (http://www.syberworks.com/)	Not disclosed	Commercial	Not disclosed
WebStudy (http://www.webstudy.com/)	Not disclosed	Commercial	Not disclosed

Legend:

Green: Perfect aspect

Yellow: Not disclosed

Red: Knock-out-aspect

3.2 Pre-selection of convenient systems

Based on the preceding compendium of e-learning systems it is possible to narrow down contemplable platforms. For cost and licensing reasons “AngelLearning”, “Blackboard”, “Desire2Learn”, “eCollege”, “It’s learning”, “Learn.com”, “Syberworks” and “WebStudy” are out of the question.

Furthermore “.LRN”, “AnaXagora – LCMS”, “Docebo”, “Fle3”, “Ganesha”, “OLAT”, “Prométhée” and “Sakai” don’t meet our demands. Not only due to unavailable “language packages” for the languages required, but also due to technical inaccessibility.

“eFront” features mechanical translation into Bulgarian and Romanian language, which creates space for interpretation and most likely will cause a decline of quality. Therefore this platform is excluded from the further breakdown.

“ATutor”, “Claroline”, “Dokeos”, “Ilias”, “Moodle” and “Nano-Train” are up to all specified standards and will be evaluated particularly in the following chapters.

4 COMPARISON OF FEATURES

4.1 Detailed overview of selected platforms

After the first pre-selection ATutor, Claroline, Dokeos, Ilias, Moodle and Nano-Train remain for further testing. A detailed analysis of the demo versions available on the official websites, detect the factual capability of the several systems. “Ilias” doesn’t provide a demo version; for this reason detailed information couldn’t be collected. The following chart contains the remaining platforms related to their preferable features and clarifies which systems won’t be considered.

Features	ATutor 1.6.2	Claroline 1.8.11	Dokeos 1.8.5	Ilias 3.10.4	Moodle 1.9	Nano-Train
Unicode/UTF-8 support	✓	- [1]	✓	✓	✓	✓
Cyrillic alphabet support	✓	✓	✓	✓	✓	✓
Role-based user access[2]	✓	✓	✓	✓	✓[3]	✓
Project management tools	-	-	-	[4]	✓[5]	✓
Mathematical formulas	-	-	-	-	✓ Tex filter and algebra filter	-
Tex / LaTex support	✓	✓	✓	✓	✓	-
Embedding of multimedia	✓ mpeg, mov, wmv, swf, mp3, wav, ogg, mid, YouTube	✓ swf, mp4, wmv, mp3,flv	✓	✓	✓ mp3, swf, mov, wmv, mpg, avi, flv, ram, rpm, rm	✓
Online tests with immediate evaluation [6]	✓	✓	✓	✓	✓	✓
Standard compliance (e. g. SCORM)	✓	✓	✓	✓	✓	-

Features	ATutor 1.6.2	Claroline 1.8.11	Dokeos 1.8.5	Ilias 3.10.4	Moodle 1.9	Nano-Train
Data import	✓	✓ SCORM	✓ SCORM, AICC	✓	✓ IMS/SCORM	-
Data export	✓ IMS, SCORM	✓ SCORM, IMS&QTI	✓ SCORM	✓ XML, HTML, SCORM	✓ SCORM	-
Ease of use	-	✓	✓		✓	-
Comfortable handling of content via HTML-editor	✓	✓	✓		✓	✓
Courses hierarchically structured	✓	[7]	✓		✓[8]	✓
Customizing	Source code and modules	Source code	Source code	Source code	Source code and modules	Source code
Academic purpose	✓	✓	✓	✓	✓	✓
Established community (e. g. forum, wiki, chat)	✓	✓	✓	✓	✓	-
Miscellaneous remarks			Detachment of Claroline (2004)	No demo available	Documentation is very extensive	

[1] UTF-8 will be supported in Claroline 2.0
[2] At least student, teacher, admin
[3] Contains also course creator, non-editing teacher, guest, authenticated user, permissions are changeable
[4] Not disclosed
[5] Module to add (Task/Bug Tracker)
[6] Multiple choice, single choice, etc.
[7] Predefined sub items (Course description, Agenda, exercises, etc.), manually not extensible
[8] called meta courses

4.2 Recommendation: Analysis of e-learning systems to be considered

All learning management systems except “Claroline” support UTF-8 and the Cyrillic alphabet. The preferable role-based user management (at least admin / teacher and student) is provided by all systems. “”Moodle” features even more roles than the minimum targets given. As you can see from the chart Nano-Train is the only system featuring also project-management-tools. “Moodle” provides a module to integrate such tools.

At this point it needs to be accentuated that “Moodle” features various convenient modules to be installed uncomplicatedly.

All platforms provide the opportunity of entering teaching content via HTML-editor as well as importing SCORM1-compatible content. High usability is given by nearly all systems. Only “ATutor” requires a fairly long training period.

Embedding of multimedia-content (e. g. Videos, Flash etc.) and the creation of online tests are possible in all systems.

The wide community of “Moodle” yet existing is a great advantage over every other platform. Both, multilingual web forums and comprehensive documentation are very helpful on problem-solving of most different kinds.

Conclusion:

Considering the sum of advantages of the “Moodle”-systems and the disadvantages of others, the decision was made in favour of “Moodle”. In the next chapter there will be a closer look at “Moodle” and its features.

[1] Sharable Content Object Reference Model

5 A CLOSER LOOK AT MOODLE

5.1 Installation

The installation of the “Moodle” system turned out to be quite simple. The user is guided by the accompanying instructions and thereby aware of possibly missing system requirements needed for the installation.

5.2 Handling

The use of “Moodle” is quite simple and as self-explanatory as possible. Once you have logged in, you have an overview over the available course categories and the associated courses.

Image 5-1: moodle overview

When you click on a course category, you will see an overview over all the courses available in this category and a short description of each.

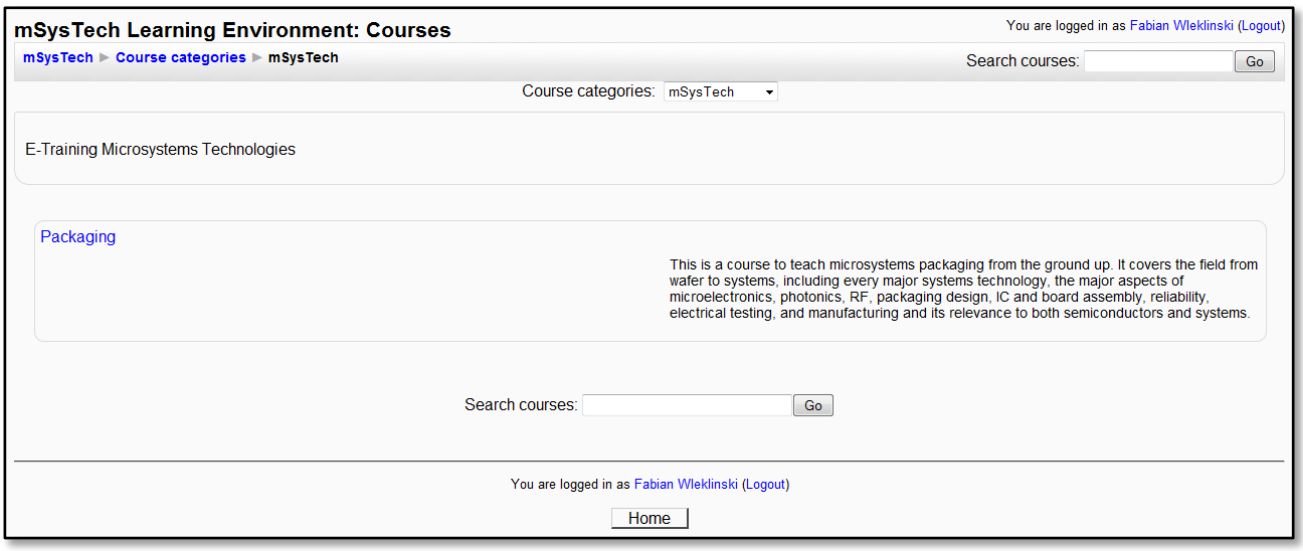

Image 5-2: moodle course category

When you enter a course, you see all the modules (such as chapters, tutorials, tests) available for this course. Depending on your user role (“teacher”, “student”) there are different functions available. As a teacher you can add/edit/delete the course modules, as a student you can read chapters and do tests.

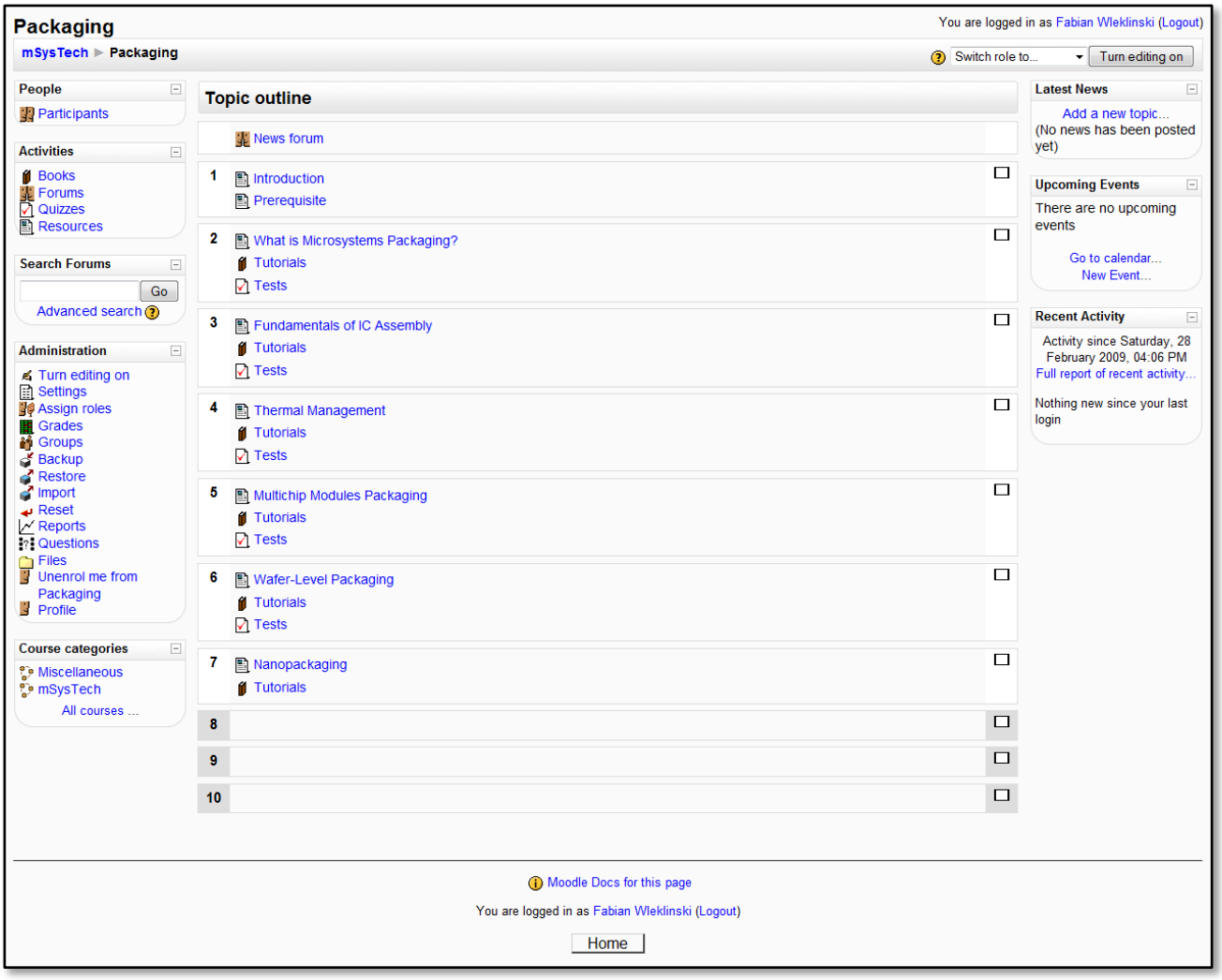

Image 5-3: moodle course

5.3 Important course modules

There are a lot of different types of course modules in “Moodle” and you can even add more by installing extensions. The three most important types of modules will be introduced in this chapter.

5.3.1 Web page

A web page is a single page and should be used for introductions or other short texts. Adding of images is possible as well.

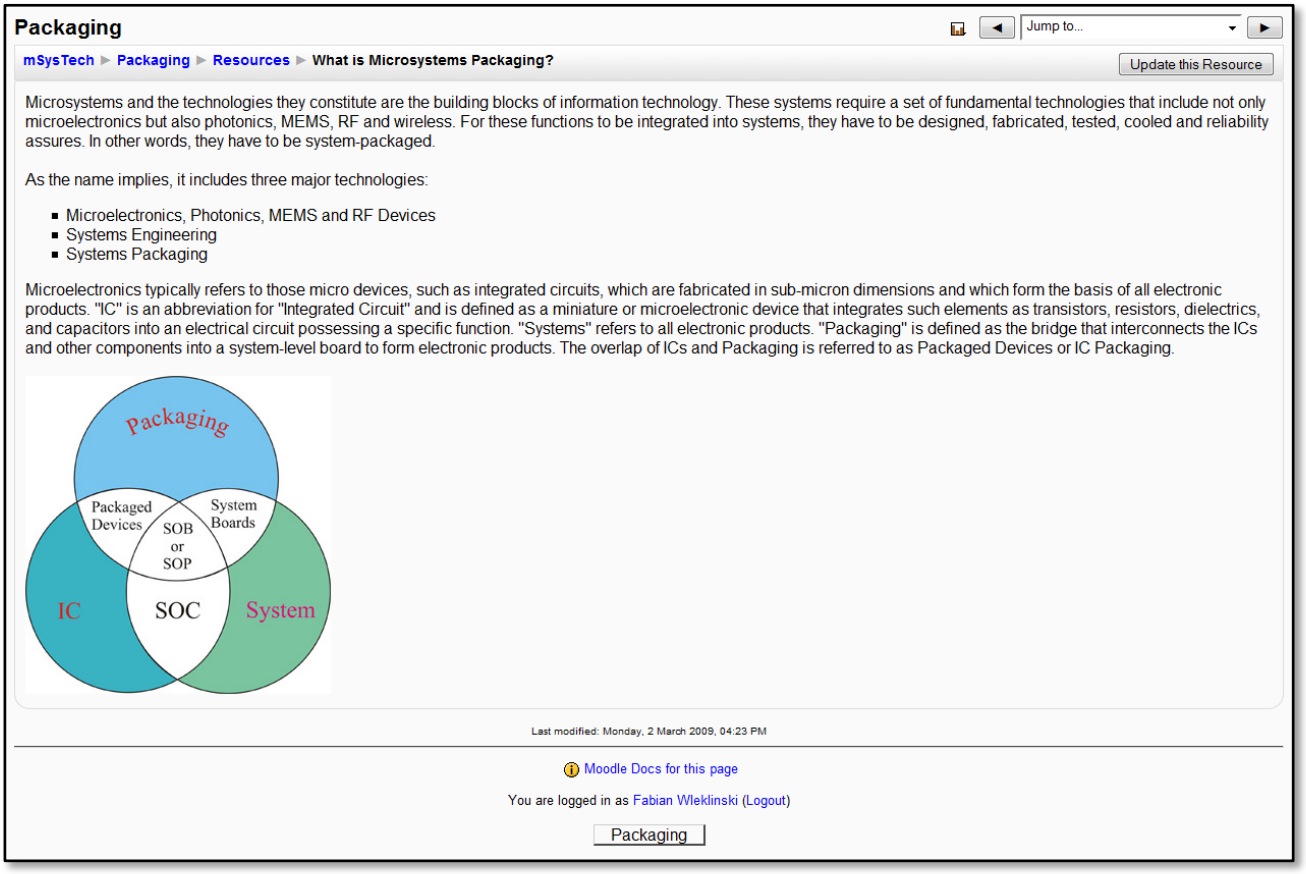

Image 5-4: moodle web page

5.3.2 Quizzy

A quizzy is a test, a student has to take. You can even add a time limit to these tests. You can also use images to reveal the questions.

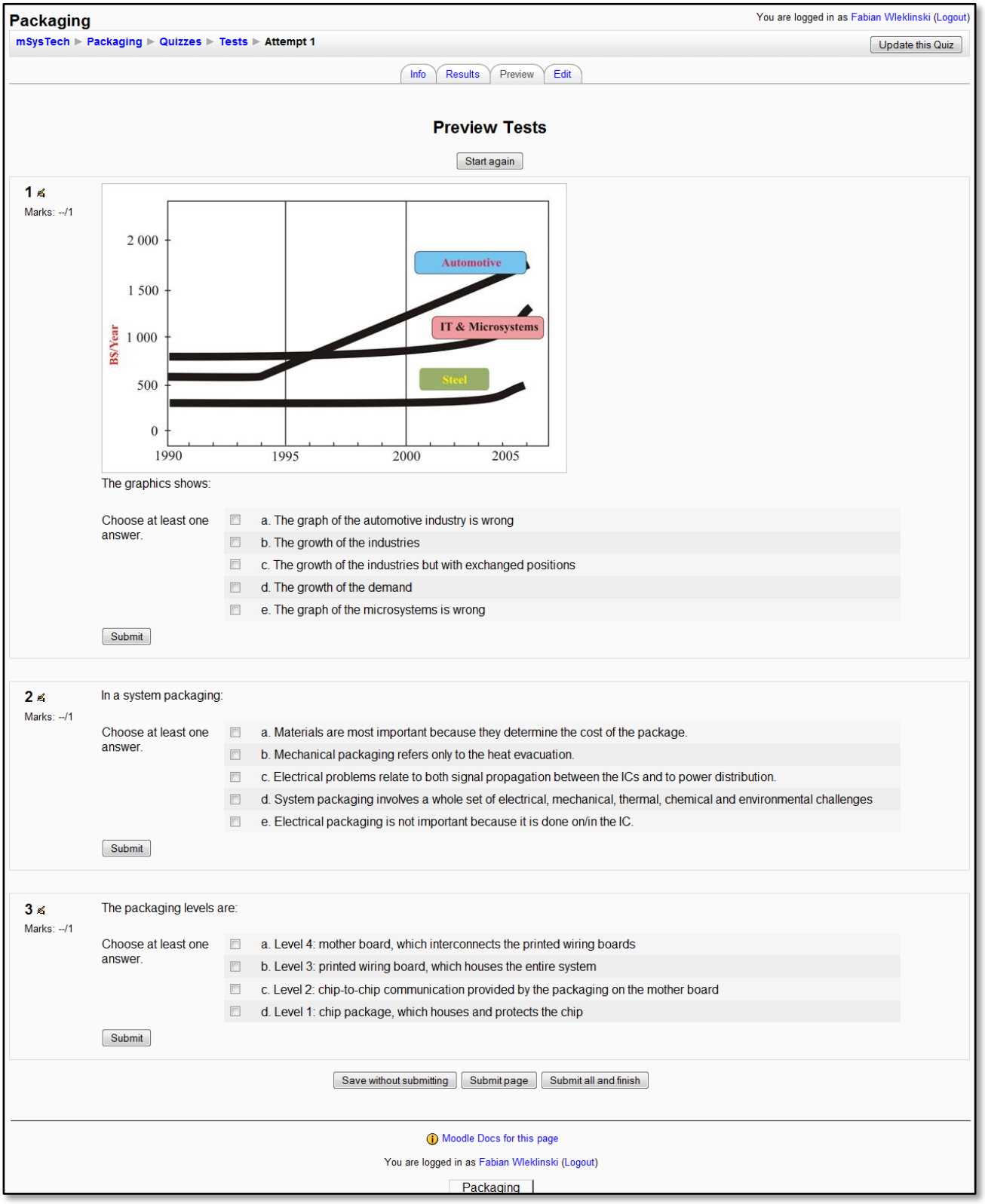

Image 5-5: moodle quizzy

5.3.3 Book

Books differ from simple web pages in the ability to create structured content in a hierarchy. Books can be used for all kinds of contents that should be taught – just like real life books.

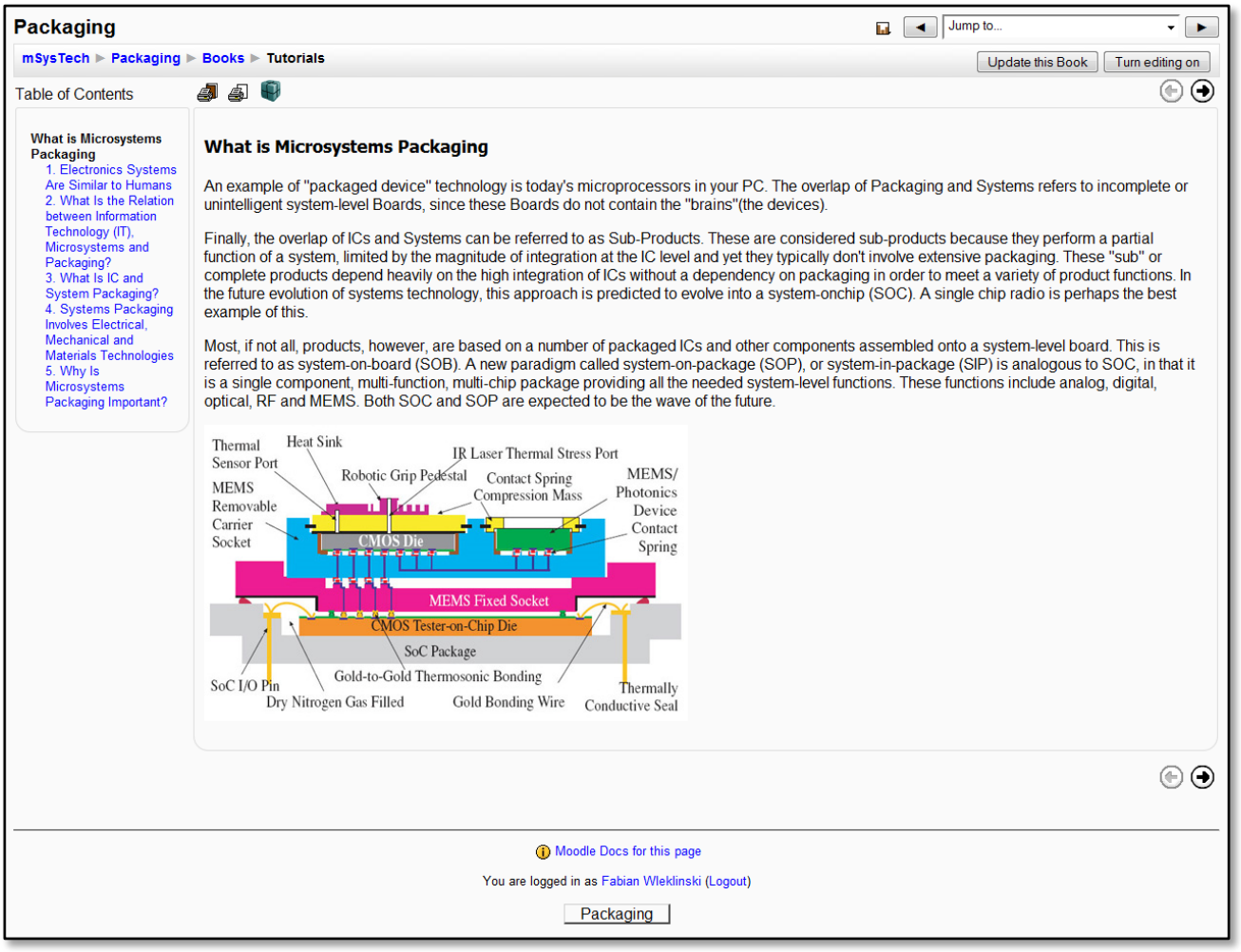

Image 5-6: moodle book

5.4 Resume

“Moodle” has a lot of features, is easy to use and can easily be extended by even more functionality. This chapter only showed the base functionality, there are lot more functions that can be useful, but under the impact of limited evaluation time and document size, these basic features have to be adequate for this documentation. All in all, you can say that “Moodle” is the right choice for the realization of our project.