

Use of Free Open Source Software in Education – An Introduction

Sara Fernandes

United Nations University
International Institute for Software Technology, Macao SAR

Overview

AIM

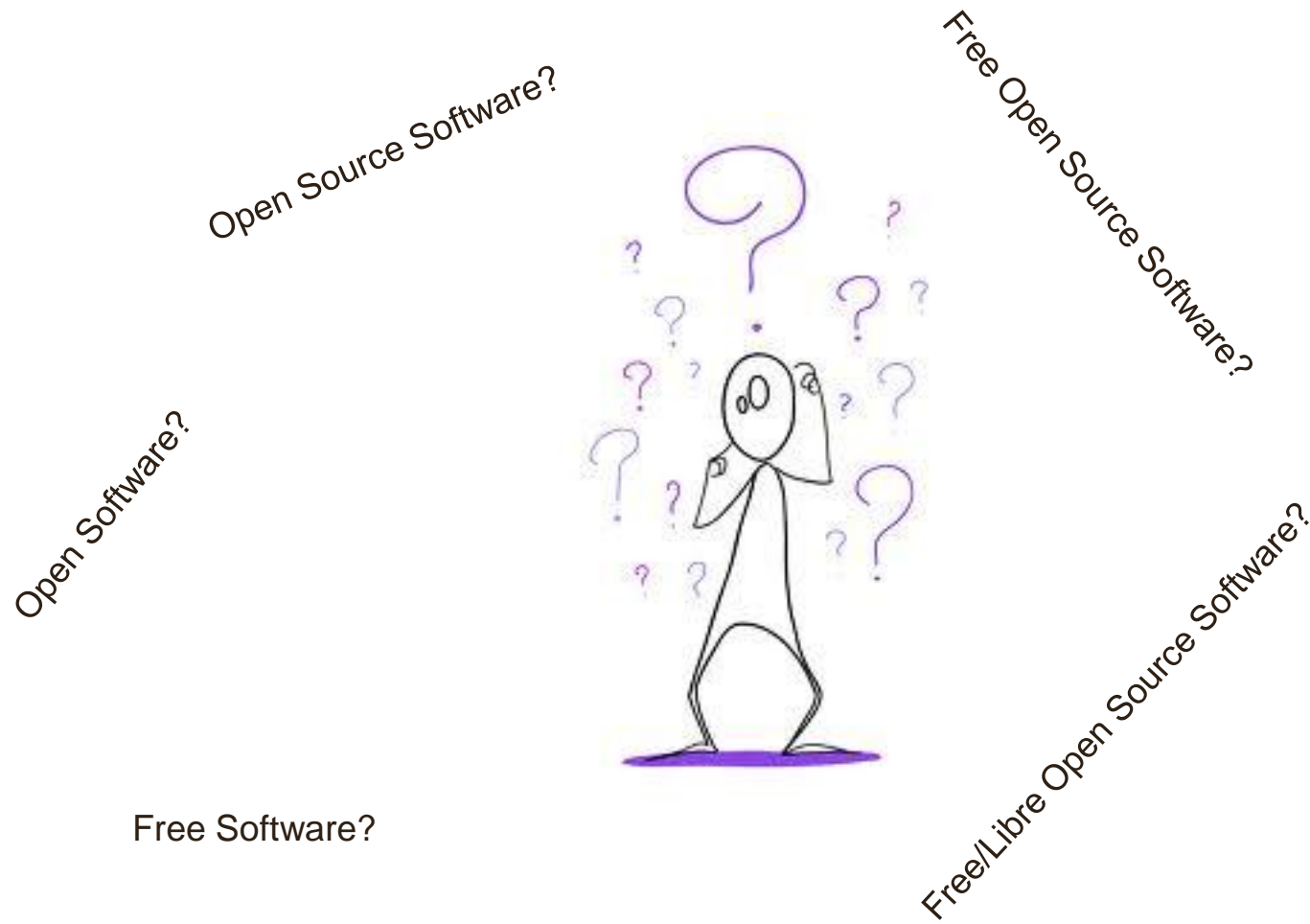
To present a brief overview of the FOSS concept and quality-related issues, followed by an analysis of the mostly used FOSS Learning Management Systems.

As an illustration, we introduce the plan for a case study developed at the University of Minho, Portugal, where FOSS projects are used to support teaching and learning activities within an Informatics degree.

OVERVIEW

- 1) Concepts
- 2) Quality in FOSS
- 3) FOSS in Education
- 4) Pilot Project
- 5) Conclusions

What are the concepts about?



Concepts

Depending on the intention of the author...

Free Software (FS)

Software that ensures that end users have freedom in using, studying, sharing and modifying that software.
Free does not refer to price, but to freedom - to copy a program and redistribute it; to change a program

[name]

Open Source Software (OSS)

Software with its source code made available and licensed with an open source license in which the copyright holders provides the rights to study, change and distribute the software to anyone and for any purpose.

Free and Open Source Software (FOSS)

Software that is both free software and open source. It is liberally licensed to grant users the right to use, copy, study, change and improve its design through the availability of its source code

Free /Libre Open Source Software (FLOSS)

Same as FOSS, aimed to avoid taking sides in the debate over whether it was better to say “free software” or to say “open source software”.

Using “Free/Libre” solves language ambiguity

Comparing Concepts

FS	OSS
Freedom for: <ul style="list-style-type: none">○ studying○ sharing○ modifying○ using	Source code available and licensed for: <ul style="list-style-type: none">○ studying○ sharing○ modifying○ using
FOSS	FLOSS
Free software and open source	FOSS + no ambiguity in the term

Quality in FOSS

“The Cathedral and the Bazaar” by Eric Raymond

Emphasize the number of contributors



but,...what about quality?

FOSS is perceived as high quality products, but there are some discussions:

PROS

- Free of costs
- Developed by volunteers with different backgrounds
- Updated and with new features

CONS

- New features releases can be delayed
- Depend on volunteers

Overview

OVERVIEW

- 1) Concepts
- 2) Quality in FOSS
- 3) FOSS in Education
- 4) Pilot Project
- 5) Conclusions

ICT in Education

Benefits of applying ICTs to socio-economic development:

- Direct – to benefit populations
- Indirect – to assist governments, NGOs, among others, in improving socio-economic conditions

[ICT4SD, wikipedia]

POVERTY (MDG1)

- Increasing market access and competitiveness of the poor
- Improving social inclusion of isolated communities

EDUCATION (MDG2)

- Increasing access to education through distance learning
- Enhancing the efficiency of educational policies

GENDER (MDG3)

- Increasing economic and job opportunities for women
- ICT for women
- Women as educators

ICT and FOSS in Education

CHALLENGE

Economic crisis and ensuring quality of education

- Funding cuts on education
- Need to reduce costs
- Costs of proprietary software
- Maintaining educational quality
- Impact of Internet on institutions

Introduce new approaches into education that will enable governments to continue promoting high-level education

SOLUTION APPROACH

Applying FOSS in Education

- Contributing to innovative approaches and cost reductions
- Allowing institutions to be more independent (pricing and licenses policies)
- Empowering users with independency to run, copy, distribute, study, change, and improve the software according to their needs

Application Example – FOSS LMS

Learning Management System (LMS)

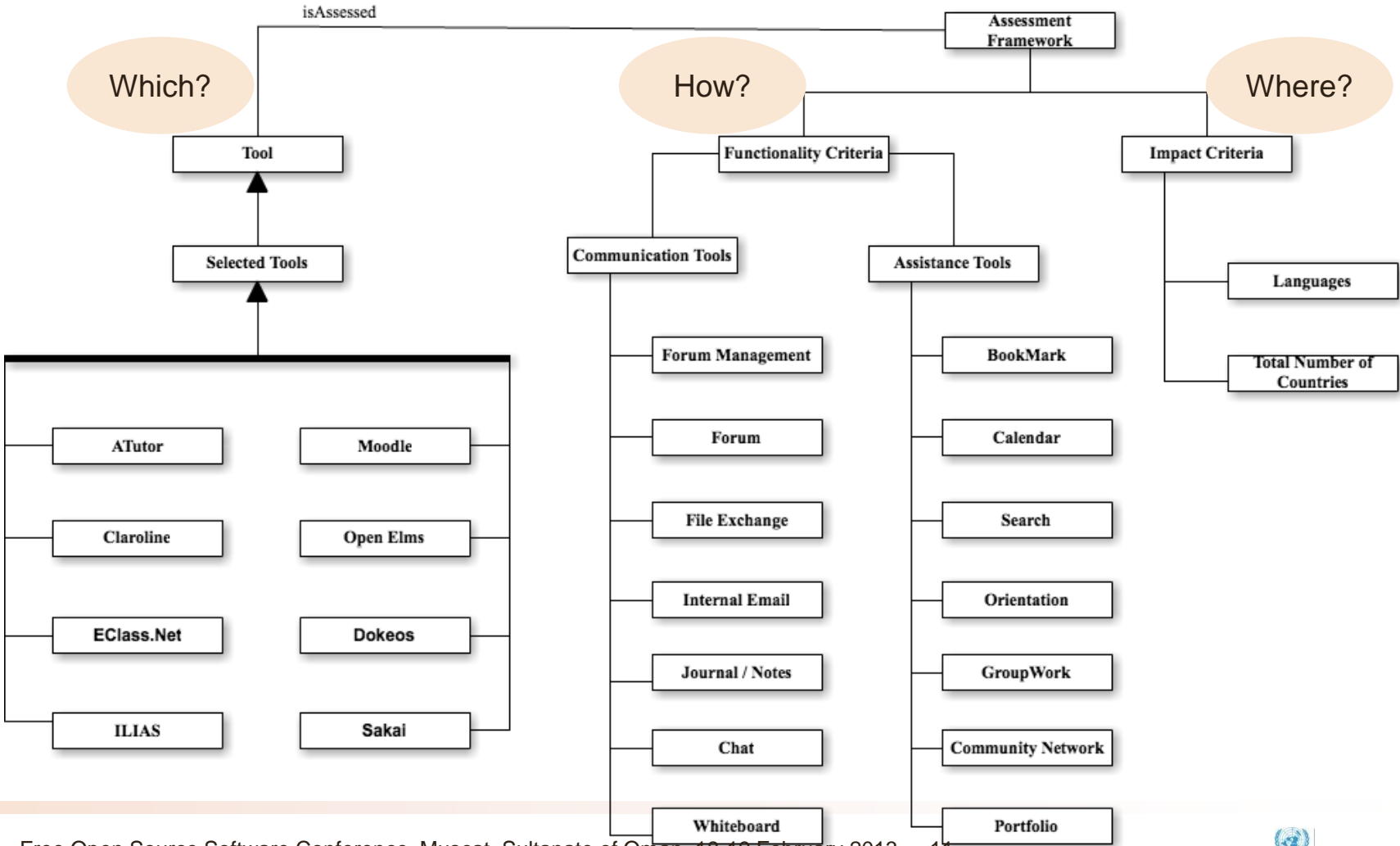
- a software system designed to support student learning
- includes a number of presentations, assessment, communication and management tools

QUESTION

are FOSS LMS being used?

- Which?
- How?
- Where?

Assessment Framework



Why – Selecting Tools

SOURCE:	Source Forge – a repository of FOSS tools
CRITERIA	<ul style="list-style-type: none">○ Keywords – tools including Learning Management System as part of their description○ Weekly downloads – indicates if the project has been recently downloaded○ Statistics using URLSPY – # of downloads, # of pages where is used, # languages, ...

Selecting Tools - Data

1) Search in Source Forge

results included +100 of educational Projects

2) Search with LMS as keywords

results included 30 projects

3) Search with weekly downloads

results included 11 projects:

- Moodle
- Dokeos
- Claroline
- Atutor
- Sakai
- ILIAS
- OpenElms
- Eclass.Net
- e-Learning Applications Suite
- Docebo reborn
- Brillhaspati

4) URLSPY statistics

- total number of years that the tool has been available
- external links – number of websites that refers to the tool website
- number of pages – visited by users within the tool website
- estimated daily users – number of users visiting the tool website

Example URLSPY Statistics Data

	WORLD WIDE RANK	TOTAL # YEARS	EXT. LINKS	# PAGES	DAILY USERS	WEEKLY DOWNLOAD
Moodle	5,717	<11	37,300	28,650	71,370	16,796
Dokeos	68,947	7	3,221	3,345	6,388	53
Claroline	110,846	<10	2,829	821	4,165	597
ATutor	154,563	>11	2,426	345	2,948	224
Sakai	206,726	>11	2,127	1,386	2,551	3
ILIAS	292,306	<11	813	356	1,240	428
Open Elms	989,640	4	92	35	398	104
EClass.Net	14,019,198	<9	36	6	16	25
e-Lear. App. Suite	n/a	>5	n/a	n/a	n/a	17
Docebo reborn	n/a	<1	n/a	n/a	n/a	28
Brilhaspati	n/a	>7	n/a	n/a	n/a	19

How – Functionality

Communication features

- Forum – students submitting posts in a discussion forum
- Forum Management – teachers creating discussion forums, moderate discussions, etc
- File Exchange – users uploading and downloading files
- Email – users sending email(s) to an entire class by using a single email alias
- Online Journal / Notes – students creating journal entries
- Whiteboard – teachers and students interacting in synchronous mode (virtual classroom)

Assistance features

- Bookmarks – organizing content
- Calendar – creating events in online course calendar and supporting announcements
- Content Search – searching for content
- Orientation – providing help to users
- Group Work – creating groups for discussions, assignments, etc.
- Community network – students creating online clubs, interest groups, etc.
- Portfolios – collecting users' work

Functionality - Data

Communication Tools	FORUM	FORUM MNGMT.	FILE EXCHANG E	E-MAIL	CHAT	ONLINE JOURNA L	WHITE-BOARD
Moodle	x	x	x	x	x	x	x
Dokeos	x	x	x	x	x	x	x
Claroline	x	x	x	x	x	x	x
ATutor	x	x	x	x	x	x	x
Sakai	x	x	x	x	x	x	x
ILIAS	x	x	x	x	x	x	x
Open Elms	n/a	n/a	x	x	x	x	n/a
EClass.Net	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Functionality - Data

Assistance Tools	Bookmarks	Calendar	Search	Orientation	Group Work	Com. Network	Portfolios
Moodle	n/a	x	x	x	x	x	n/a
Dokeos	x	x	x	n/a	x	x	x
Claroline	x	x	x	n/a	x	n/a	n/a
ATutor	x	x	x	x	x	x	x
Sakai	x	x	x	x	x	x	x
ILIAS	x	x	x	x	x	x	n/a
Open Elms	x	x	x	x	x	x	x
EClass.Net	x	n/a	n/a	n/a	n/a	n/a	n/a

Where - Impact

Criteria	Justification
<ul style="list-style-type: none">○ Number of languages○ Total number of countries	Relevant for the analysis of the concepts of Learning 2.0 and social learning, since with these parameters we can determine the range of a certain tool.

Impact - Data

	LANGUAGES	# COUNTRIES
Moodle	78	216
Dokeos	20	60
Claroline	35	71
ATutor	20	58
Sakai	12	17
ILIAS	26	53
Open Elms	1	156

Overview

OVERVIEW

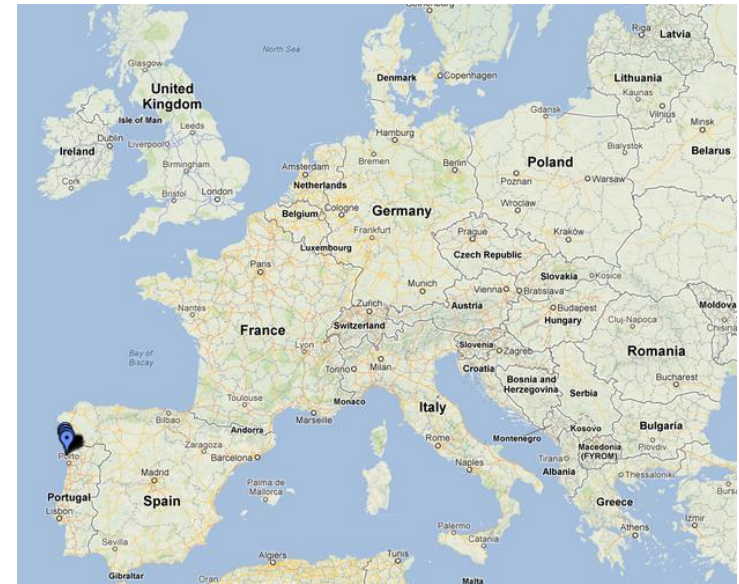
- 1) Concepts
- 2) Quality in FOSS
- 3) FOSS in Education
- 4) Pilot Project
- 5) Conclusions

Pilot Project

Minho University

Teaching Software Engineering in a MSc Program on Informatics Teaching (Spring Sem. 2013)

- Students participate in real FOSS projects
- Playing the roles of:
 - Analyst – Requirement document
 - Programmer – Coding
 - Tester – Bug report



Free Open Source Software Conference, Muscat, Sultanate of Oman, 18-19 February 2013 - <21>

Pilot Project Assessment

Parameters

- Effective participation in real-world FLOSS projects and interaction with the community
- Development of new technical skills in software development, programming and code documentation
- Development of soft skills relevant to the practice of software collaborative development – i.e. communication, initiative, synthesis, etc.
- Development of a reflexive attitude with respect to one's own practice.

Criteria

Each student's personal development with respect to each of the above parameters

Tools

- Individual project diary - daily-based interaction recording achievements, progress and difficulties
- Contributions to the relevant FLOSS community - code, documentation, messages, tests, ...
- Final individual and group reports
- Final group presentation and discussion

Conclusions

- Reform in education is needed and ICT can play a major role
- FOSS can be regarded as a tool providing innovative approaches to formal education
- FOSS LMS are tools widely used
- A proposed approach is to include FOSS in normal curricula in higher education



the standard: proprietary closed/corporate

ADOBE CREATIVE SUITE 4 DESIGN PREMIUM \$1799.00US

MAC OS X LEOPARD \$129.00US

OFFICE 2008 STANDARD EDITION \$399.95US

the standard: agile/open/community

THE GIMP INKSCAPE/SOFTWARE COMPILER PROCESSING \$0.00

LINUX \$0.00

OPENOFFICE.ORG \$0.00

try open.



Thank you!

Sara Fernandes
sara.fernandes@iist.unu.edu