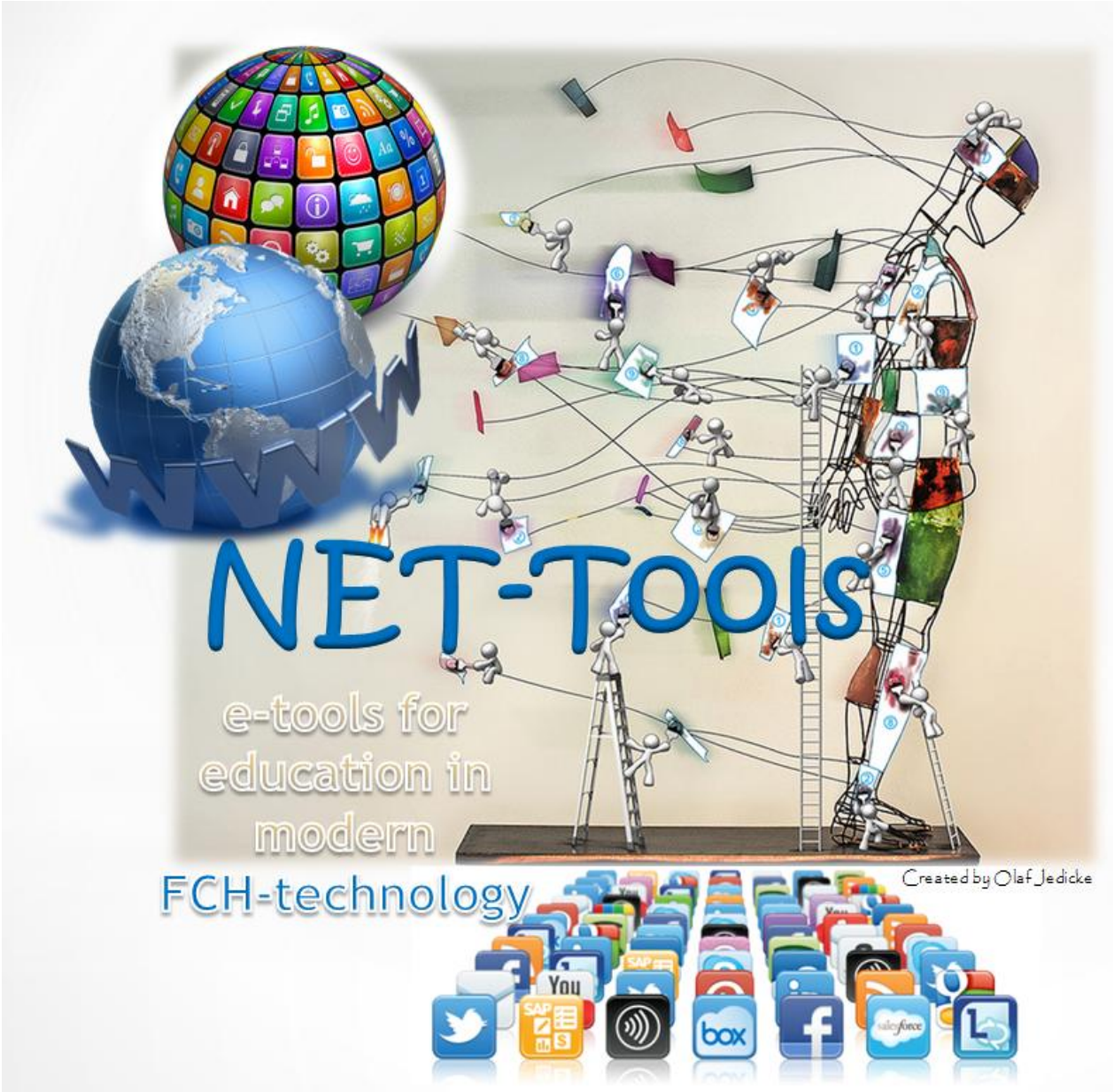
Novel **E**ducation and **T**raining **Tools** based on digital applications related to hydrogen and fuel cell technologies

Deliverable



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D2.4: LMS Review

Due date of milestone according DoA	**31th August 2017**
Completion date of milestone	**20th March 2018**
Dissemination level (CO, CI, PU)	**PU**
Nature (other or report)	**Report**
Version of milestone	**MS2.1 LMS Selection including all project information and its objectives and project targets** **MS4.2 Specifications for E-learning platform in place**
File name (share point version)	LMS Review
Responsible partner for milestone (acronym)	**PersEE**
Means of verification	
Contributing partners (acronyms)	**DTU**

Contents

1. Introduction

1.1 General introduction and definition

A LMS (Learning Management System) is a platform for hosting a course, while a MOOC is the course itself. A MOOC can be run on a LMS, but it doesn't have to be. In the same vein, a LMS can be used to host a course that is not a MOOC. The major MOOC platforms — Coursera, Udacity, and so on — involve both a LMS and a MOOC. For example, if you take a course on Coursera, you are taking a Coursera MOOC that is hosted on the Coursera LMS.

MOOCs and traditional LMS-style courses differ as highlighted further in the document.

LMS are primarily designed to manage user accounts (administrators, teachers, students…), grading, curriculum, schedule and also host course material. Newer versions of LMS allow to create and host interactive courses, but this is not their core features. MOOC platforms, on the other end, focus on providing courses. There are many other types of e-learning softwares for authoring teaching material, hosting online classrooms, creating quizzes, training…

1.2 Purpose of the review

As the landscape of instructional technology continues to evolve, it is confusing to identify the tool or service that will fulfil NET-TOOLs needs in the most effective way.

This review aims to shed some light on the different options available.

The intention is not to conclude on the best alternative but rather to provide information, pros and cons about the different options in order to allow for a fruitful and informed decision by the consortium, decision which is due in M7.

1.3 Scope of the review

The eLearning industry has grown exponentially in the last decade. Consequently, LMSs have flourished and it has become impossible to complete an exhaustive LMS review. Hence we made the choice of reviewing the most prominent or promising LMS which include:

- 3 of the main LMSs on the market:
  - Blackboard Learn, the main commercial solution, market leader in the USA
  - Sakai, a new solution that is gaining popularity both in the USA and in Europe
  - Moodle, the open source reference on the market, leader in Europe
- 3 of the main MOOC platforms:
  - Coursera, which is the main MOOC platform worldwide
  - Udacity, a major US competitor of Coursera.
  - Open EdX which has gained momentum since a major feature upgrade a year ago

Few alternative e-learning softwares are further presented in annex.

2. Main LMS

2.1 Moodle

Moodle is open source and totally free, but certain optional peripherals and support from third parties can cost money. Users should keep in mind that although open-source softwares are free, the technical resources needed to host them come at a price that might match the overall price of hosting proprietary software.

Fig 1: Moodle's welcome screen

2.1.1 Differentiating features

Moodle has most of what you would expect in an LMS, including student dashboards, progress tracking, and support for multimedia classes. Additionally, it includes mobile friendly themes, support for third–party plug–ins and add-ons, and the ability to sell courses using PayPal.

Considerations

Because Moodle is a big player in the open-source LMS space, it is supported by a large, active community with tons of plug–ins and options to customize it to your exact specifications. It also benefits from a lot of online documentation for help with support issues or questions, as well as loads of preconstructed courses that may just save you from having to create your own content.

All this comes at a price, however, and Moodle has been criticized as overly complex and difficult for a layperson to learn and set up. Other potential downsides include incomplete reporting and no easy way to manage groups of learners.

2.2 CourseSites by Blackboard

CourseSites—a free version released by Blackboard Learn—is aimed at individual instructors and, like Blackboard's other offerings, caters to the academic rather than the corporate market.
The software is web-based and free, and it allows the creation of up to five active "course sites" (each representing one discrete class).

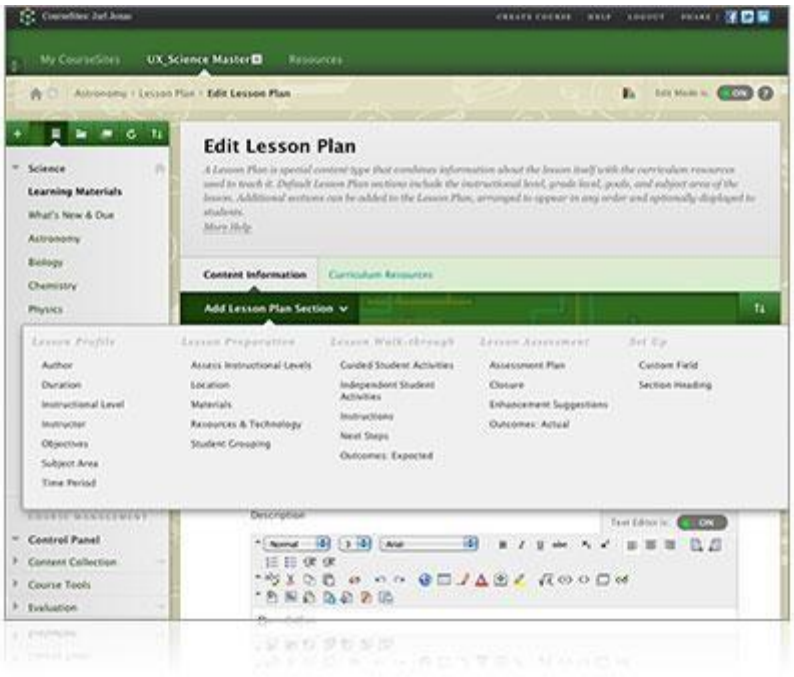


Fig 2: An example of creating a lesson plan in CourseSites

CourseSites gives users the ability to log in using popular web services such as Facebook and Gmail, and supports an unlimited number of students and easy integration with Blackboard's other offerings.

Considerations

CourseSites is not open source software, so it avoids some of the issues which plague those (lack of support, a requirement that you be tech savvy to implement,etc.). It is, however, missing some of the functionality of Blackboard's paid offerings, which may make it less useful for institutions and organizations. These include white-labeling and branding features, custom scripts, single sign-on, integration with a wider enrollment system, and the ability to batch and archive things such asgrades.

2.3 Sakai 11

Another open–source solution, Sakai differs from Moodle in a few key ways. It is built on Java, as opposed to PHP) and while it is open source, only certain key stakeholders and commercial affiliates are allowed to contribute to the source code. It is aimed at academic institutions as opposed to corporate training.
The Sakai 11 update aimed to make the interface cleaner (and more optimized for mobile), as well as improve navigation. Sakai also overhauled the gradebook and assessment systems and added tools to lesson design.

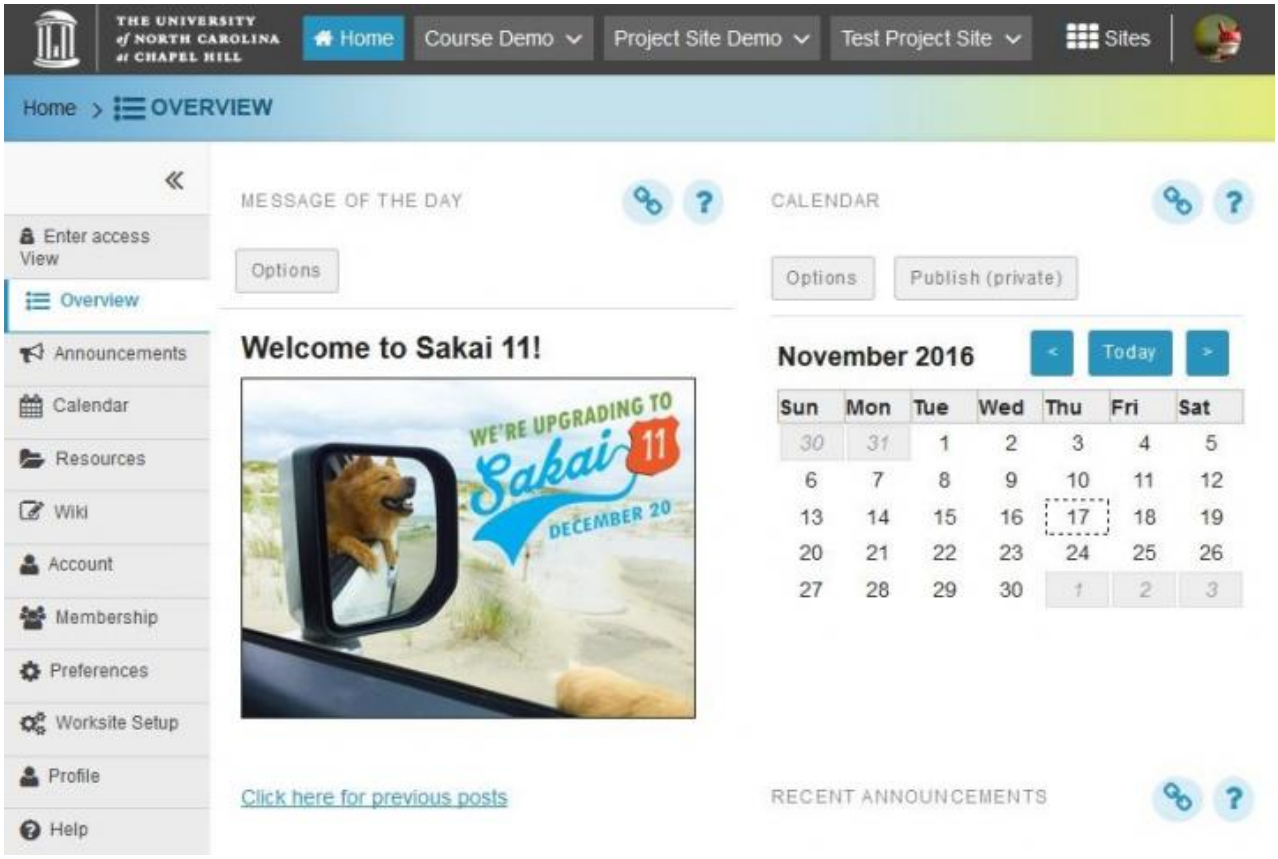


Fig 3: Calendars within Sakai

2.3.1 Differentiating features

Sakai integrates with Google Docs, and includes tools such as a wiki, online testing, presentation slides and the ability to use Dropbox.

Considerations

Sakai enjoys the support of a well-endowed educational foundation, which oversees the strategic development of the software. This means that significant resources can be brought to bear should any major issues arise.

Sakai serves a narrower clientele and so there is not as broad a community of support, plug–ins and add-ons.

2.4 LMS penetration

When selecting a LMS, or a software in general, it is important to look at who and how people use it. Largely adopted LMSs have been proven by their user base, so we can assume they are robust enough. They also have a large community of users/developers who share their problems and solutions between each other, which means it should be easier to find help if we are facing an issue. Another point is that complementary softwares try to be interoperable with the big names on the market, so it is more likely to find an ecosystem of products interacting with market leader LMSs.

Here are some recent figures concerning LMS market shares in Europe and the USA.

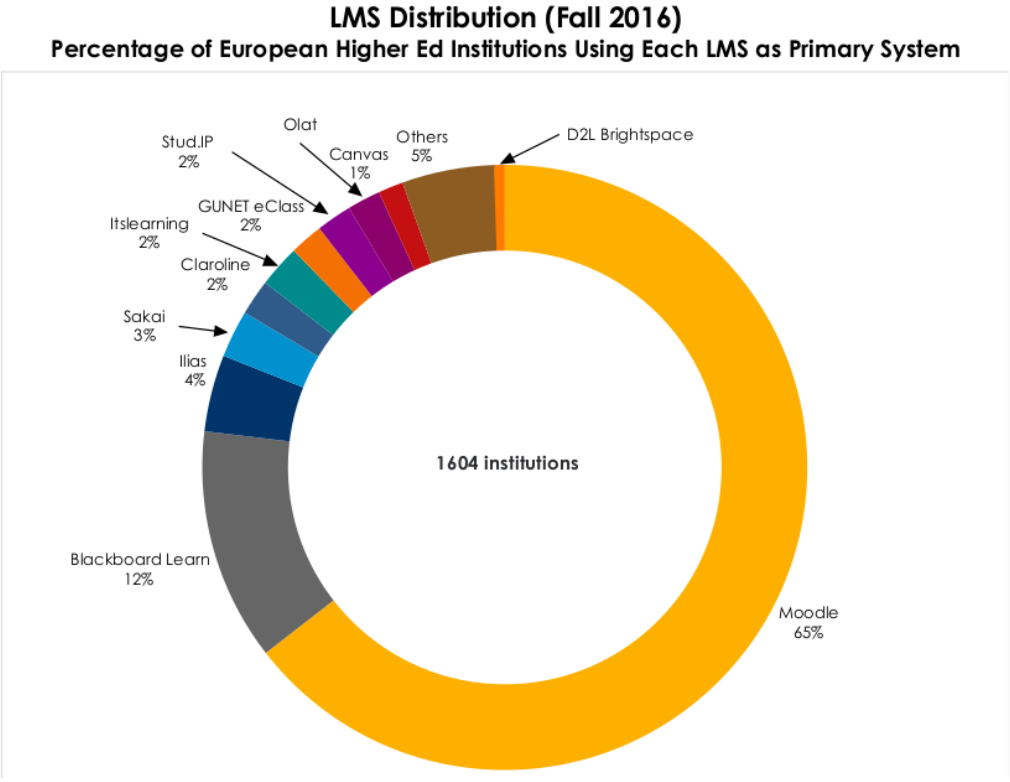
USA, spring 2017

	Blackboard Learn	Sakai	Moodle
Institutions	1185 (33%)	713 (19.8%)	678 (18.9%)
Enrollments	7,383,086 (43.5%)	4,773,367 (28.1%)	2,611,762 (15.4%)
Average size	6246	6704	3852
Median size	3365	3295	1899

[1]

It is interesting to note that although American schools used to sometimes have multiple LMSs, there is a trend to consolidate and have one single LMS per school. This could be explained by the fact that schools have been having two LMSs at a time while switching from one vendor to another.

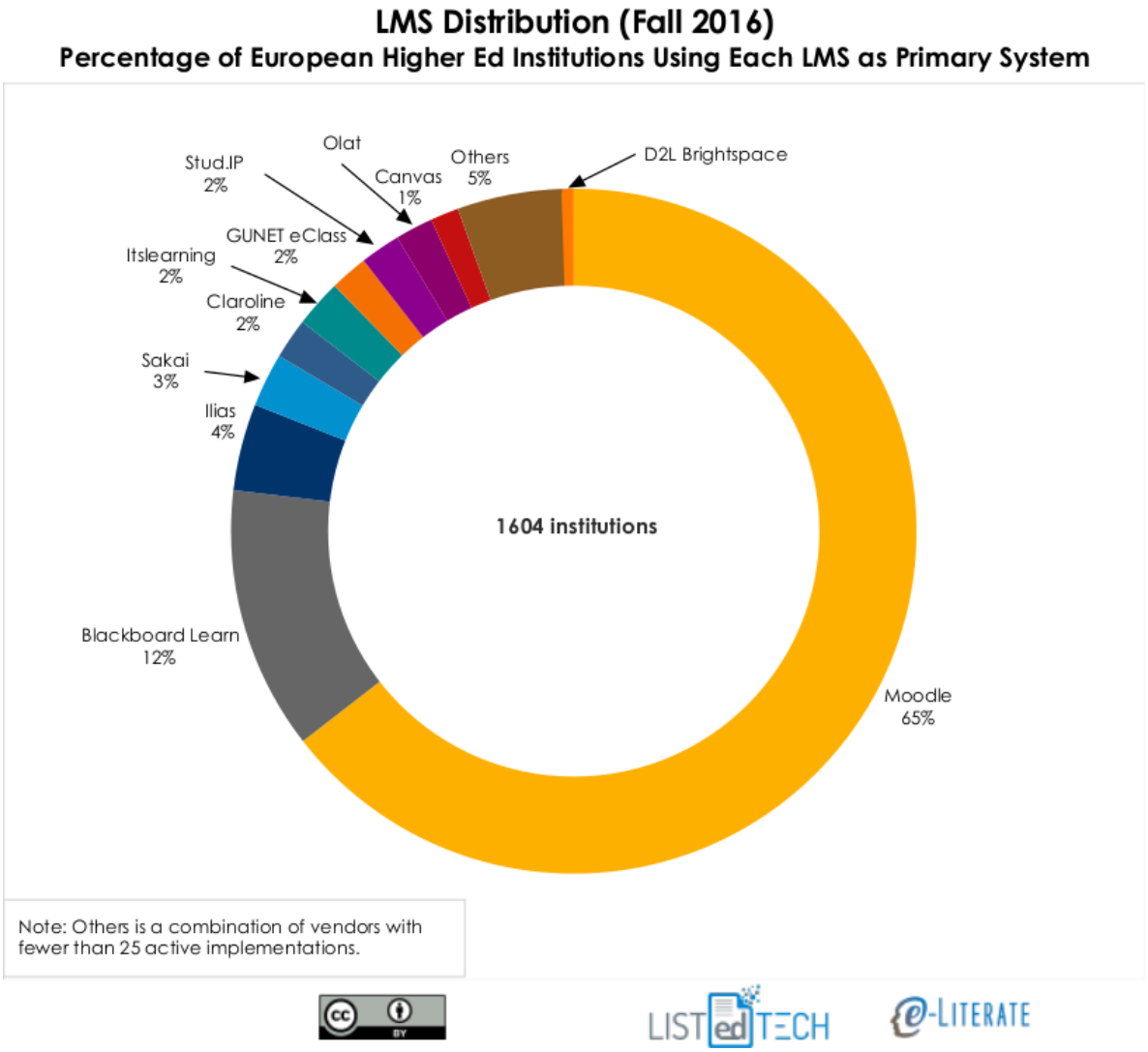
Fig 4: Europe, fall 2016 [1]



[1] EUROPEAN LMS MARKET DYNAMICS Fall 2016 Report by MindWires

Blackboard is losing market shares; Moodle is stagnating and Canvas is gaining market shares.

Fig 5: LMS Distribution[2]



Besides, Web CT which used to be a major player at the turn of the century has almost vanished now, highlighting the risk when selecting a LMS.

Beyond the European trends, the graph below shows that there are very strong national preferences where:

- Ilias is rather present in Germany. Without surprise, this is the LMS used at KIT
- Blackboard Learn is particularly strong in the Netherlands and the UK. This is the LMS used at Ulster.
- Itslearning is essentially present in the Nordics.

[2] EUROPEAN LMS MARKET DYNAMICS Fall 2016 Report by MindWires

Fig 6: Historical LMS Market Share in Europe

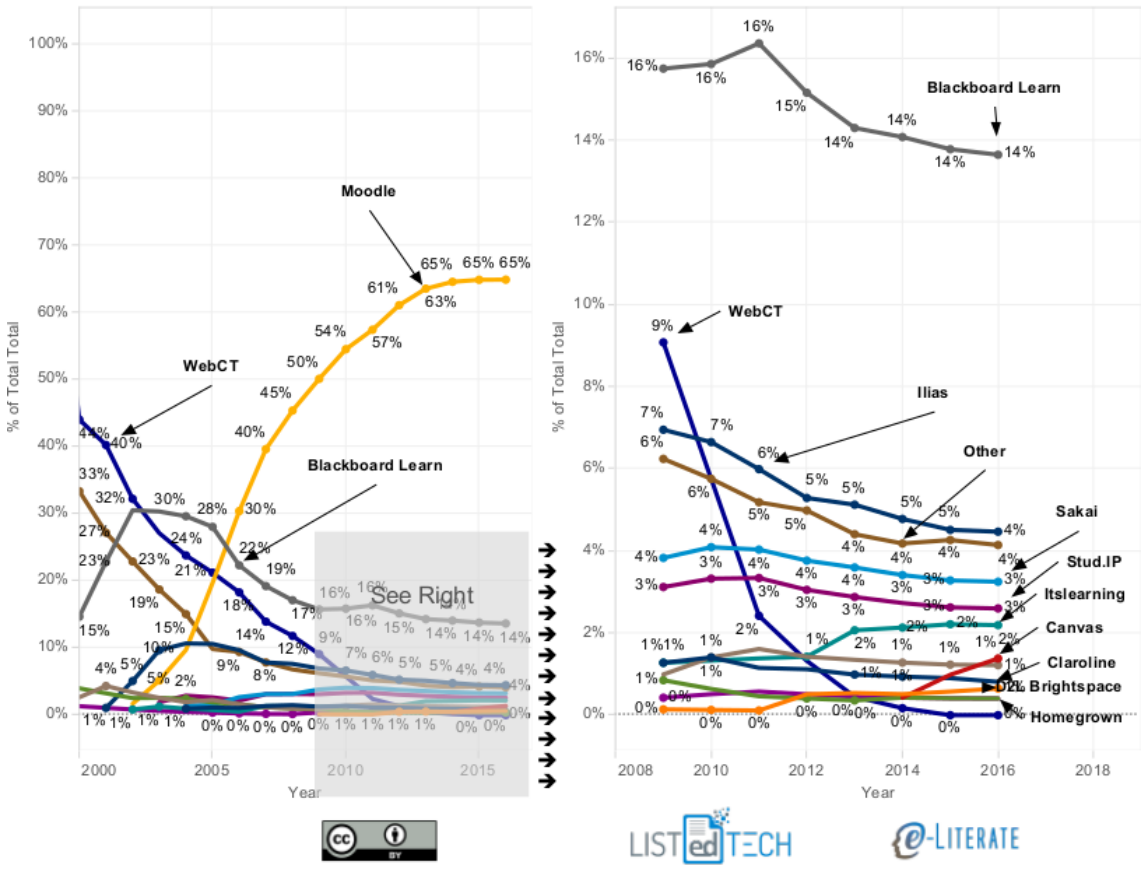
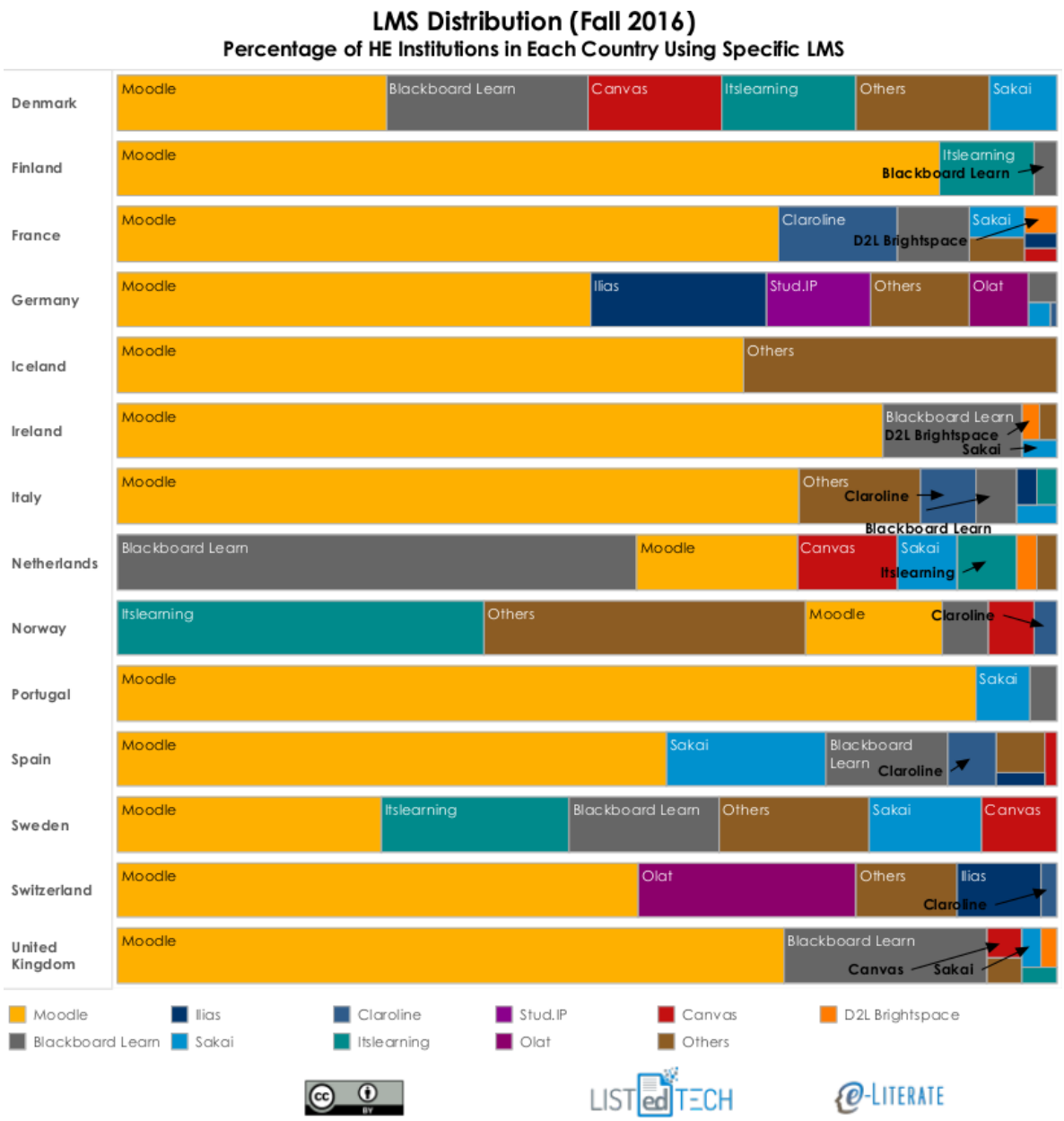
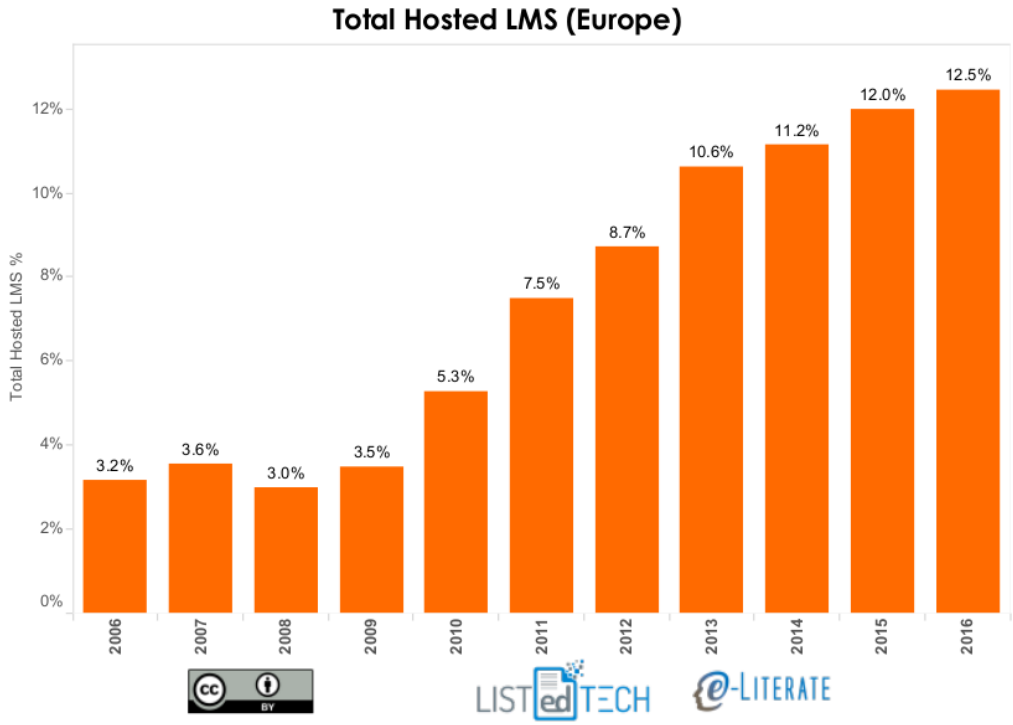


Fig 7: Historical LMS Market Share per country



Besides, it is important to note that many LMSs now have “hosted” versions, meaning that instead of the academic institution hosting its own implementation of an LMS on its own servers, it gets an access to a LMS in the cloud, provided either by the company making the LMS or a tier organisation. The institution pays a fee (usually annual and depending on the number of students) and gets rid of the burden of having to maintain its LMS and its servers and is guaranteed to always have the newest versions of the LMS.

Fig 8: Total hosted LMS in Europe



This figure above shows how European institutions have been switching over the past years to hosted (or cloud based) LMSs.

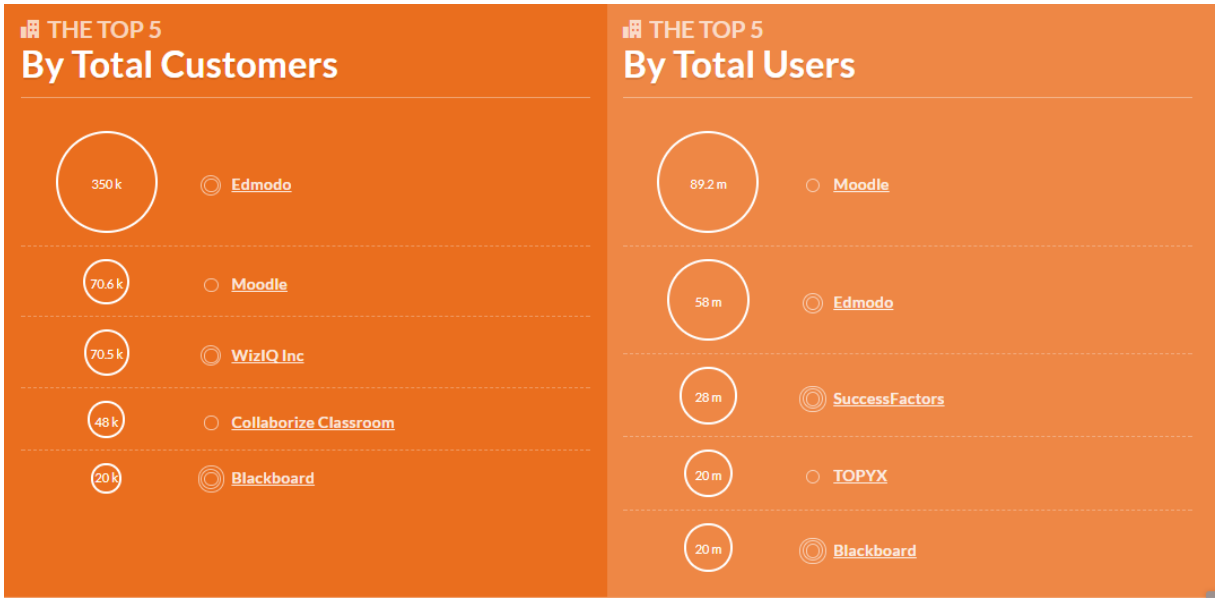
To provide a more global perspective, the figure below represents the penetration of the main LMS in the US where Moodle and Blackboard share a prominent place though Edmodo is leading this market.

Fig 9: LMS Market Share in the US[3]

[3] https://www.lms.org/reviews/

From a user perspective, Moodle remains the main LMS as highlighted below:

Fig 10: Breakdown of LMS Market Share in the US[4]



2.5 Features

Another important question to answer when selecting a LMS is: “What do we want it to be able to do?”. This has been a tricky question when making this review for two reasons.

2.5.1 LMS comparison items

Below listed generic comparison items which fit the initial Assessment need performed between WP2 and WP4 leaders which is annexed to this document

1. Affordability
2. Ease of installation and maintenance
3. Content creation/management simplicity
4. Design & branding flexibility
5. Social & collaboration functionality
6. Mobile access
7. Payments & Ecommerce functionality
8. Student management & statistics
9. Grading functionality

[4] More : https://www.capterra.com/learning-management-system-software/#user-friendly

Other features:

1. Interactive video lectures with subtitles and indexing on subtitle (downloadable).

2. Study materials like books, notes, cheat sheets, etc (downloadable).

3. Online test of different types like video embedded quiz, practice sessions, midterm exam, final exam, etc.

4. Virtual Laboratory with interactive interface for user to view the expected simulation.

5. Calendar based schedule.

6. Multi lingual support.

7. Discussion forums.

8. Wiki edits for implementing collaborative learning.

9. Progress reports and other kinds of embedded analytics.

10. Different kinds of assessment systems for submitted assignments (open response problems).

2.5.2 LMS comparison

Therefore, we selected a list of features that we think would be interesting in the project and would allow to differentiate the LMSs we have selected for the comparison.

Fig 11: Comparison of LMS per functionality

	Blackboard Learn	Sakai	Moodle
SCORM import	Yes	Yes	Yes
Bundled Course Content	Yes	Yes	No
Instructor-Led Training (ILT) Support	No	Yes	Yes
Google Apps Integration	No	Yes	Yes
Single Sign-On (SSO)	Yes	Yes	Yes
E-Commerce	N/A	No	Yes
Developer API Available	Yes	Yes	Yes
Gamification Features	Yes	Yes	Yes
Mobile Access	Yes	Yes	Yes
Progamming language	Java	Java	PHP
Open Source	No	Yes	Yes

3. Main MOOC platforms

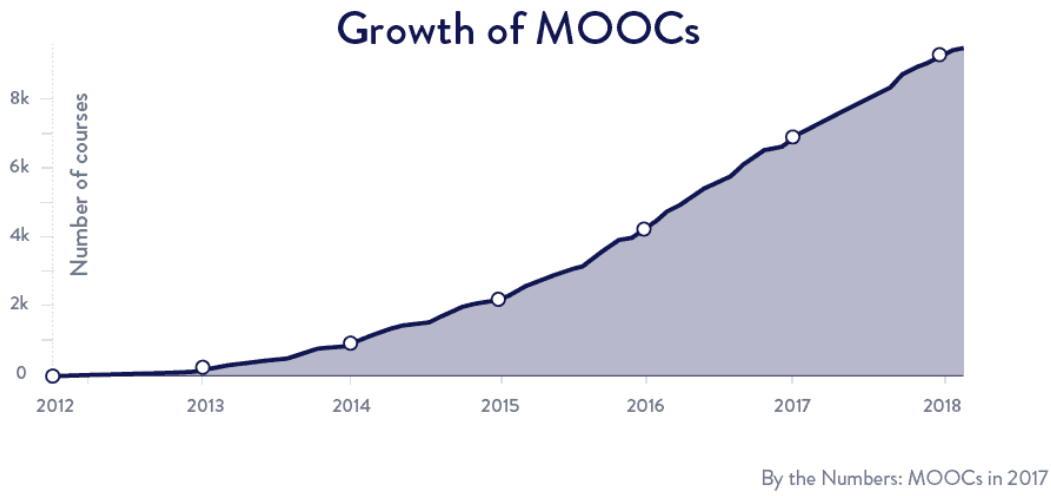
3.1 Introduction

This is the fifth year since the start of the "modern" MOOC movement (which traces its birth to 2012, when the first Stanford MOOCs took off). For the first time, we are seeing a slowdown in the number of new learners being added.
Around 23 million new learners signed up for their first MOOC in 2017, taking the total number of learners to 81 million. This is similar to the 23 million learners added in 2016. The top two MOOC providers in the world (by registered users) added similar numbers of learners in 2017 as they did in 2016[5].
Here is a list of top five MOOC providers by registered users:

1. Coursera – 30 million
2. edX – 14 million
3. XuetangX – 9.3 million
4. Udacity – 8 million
5. FutureLearn – 7.1 million

Even if growth in users was fairly flat last year, new courses continued to be created and launched as aggressively as ever. To date, over 800 universities around the world have launched at least one MOOC. MOOC providers are also partnering with companies (mostly tech) to launch courses. The total number of MOOCs that have been announced stands at 9,400, up from 6,850 last year. The number of total MOOCs available for registration at any given time has also gone up due to tweaks in the scheduling policy by MOOC providers.

Fig 12: Historical evolution of MOOC offer



More than 500 MOOC based credentials are now available. Coursera's Specializations lead the pack with over 250 credentials; followed by edX with around 170 credentials split across 4 types: MicroMasters, Xseries, Professional Certificate, and Professional Education. XuetangX also launched 8 "micro-degrees". Many (if not the majority) of the new courses that were launched in 2017 are part of credentials. A few of the longer courses originally launched in 2012 and 2013 have also been split up into multiple courses and re-launched under a credential.

[5] https://www.class-central.com/report/mooc-stats-2017

3.2 Overview of selected MOOC platforms

Most Massive Open Online Courses are offered through dedicated platforms which are owned by either for-profit or not-for-profit organisations. Below we give an overview of some of the preselected multi-partner (more can be found in annex):

Coursera is a US-based for-profit educational technology company that offers MOOCs from higher education institutions around the world, including many in EU Member States, such as the University of Edinburgh in Scotland, Università Bocconi in Italy, Erasumus University Rotterdam in the Netherlands, Ludwig-Maximilians-Universität München, Germany, CentraleSupélec in France and Universitat Autònoma de Barcelona, Spain.

EdX is a non-profit MOOC platform, also primarily populated with courses from US-based institutions. The platform makes the underlying software available as open source for use by others. European partners on the platform include TU Delft and Wageningen University in the Netherlands, a cluster of seven French universities under the banner of Sorbonne Universités, Sweden's Karolinska Institute, Technische Universität München in Germany and Belgium's Université catholique de Louvain.

Udacity is a for-profit MOOC platform founded by Sebastian Thrun, David Stavens, and Mike Sokolsky. The origin of the name Udacity comes from the company's desire to be "audacious for you, the student". While it originally focused on offering university-style courses, it now focuses more on vocational courses for professionals.

3.3 Features

3.3.1 The Basic Features across MOOC platforms

The 3 platforms considered support the following features for hosted MOOCs.

A Video Component: A Video Component: The teacher records a lecture that's typically broken into small chunks (two to ten minutes). Other media (YouTube clips, etc.) is often integrated into the lecture as well.

Reading Material: Free ebooks or other written materials are usually required or recommended.

Integrated Activities: One great feature that MOOCs usually utilize is breaking up lectures and reading with activities that vary depending on the course. These activities could take the form of questions, a small-scale project (such as developing one or two lines of programming code), or redirecting to an outside source of information or experience.

Course-Specific Forums: Since you can't interact with other students or your professor in person, it's important to have a way to ask questions and get other perspectives online. Our top three recommended platforms integrate a forum into each course that allows for questions to be quickly addressed by the community or moderators.

Sectional or Weekly Organization: Most MOOCs are organized into a series of sections or weeks (depending on whether the course is scheduled or a "learn-at-your-own-pace" course).

Sectional Test or Project: You can usually expect there to be some sort of project or test at the end of each section to reinforce what was learned in that section or week.

Final Examination or Project: There is typically some sort of final examination or project that measures whether the student has an acceptable grasp on the skills and concepts presented in the course. Most MOOCs are "pass/fail" meaning that there isn't a letter grade given out, and some give you the option to keep trying until you succeed.

To perform a more in-depth review, we selected 5 more criteria of comparison:
Credentialing (since no business case could be built without it)

- Does the platform offer verified certificates?
- Does the platform offer completion certificates for all courses for free?
- How many courses are offered with the ability to gain college credit?
- How many learning pathways or specializations are offered?
- How many accredited degrees can be earned?

Course diversity (given the breadth of HFC learning)

- How many courses can be made available?
- How many search filters does the platform have?
- How many categories of courses can be implemented?

Course features

- Is there both automated and peer (or other human) grading?
- How many languages are video subtitles available in?
- Is there a fully functional mobile app?
- Are there course-specific forums?
- Is there a course ranking or review system?

Social features

- Does the platform have social profiles?
- Is there a recognition and reputation system for users who contribute to the community?
- Is there a system that allows students to learn together?

Partner institutions

- How many partner institutions does the platform have?
- How many courses are provided by partnered institutions?
- What is the comparative ranking of the platform's partner universities?
- Are there instructor profiles?

The 3 platforms are quite comparable along these criterias. A few differences are worth mentioning:

Coursera

Best for: Learners who want access to the most MOOCs and widest variety of learning pathways

Coursera's main advantage is scale – it has the most MOOCs, the most learning pathways, the most partner institutions, and offers the most languages. Coursera's partner universities also have the highest cumulative rank. The only other platform that is providing MOOCs on Coursera's scale is edX. For instance, Coursera has 2,150 MOOCs, edX has 1,500, and the next closest platform only has 294.

The platform only has four search filters (compared to edX's six filters), and it only offers courses across 10 academic categories, while edX offers courses across 16 categories. Another downside is Coursera's lack of consistency with pricing. Coursera's current pricing model allows the institution and instructor that offers the course to determine the cost – prices range from $20 to $200. You can "explore the course material" for free, but may not have full access to certain course features like graded assignments. Most specializations require a monthly subscription which can range from $40 to $90 a month (there is an option for a free trial for seven days).

Coursera is a for-profit company that was started by Stanford computer science professors Andrew Ng and Daphne Koller in 2012. The two professors first offered Stanford courses online in 2011 and were so inspired by the experience that they decided to start a company that offers MOOCs. The platform currently has 25 million registered learners and partners with 149 universities across 29 countries.

edX

Best for: Those who want access to free courses on the widest variety of topics

edX's best feature is the scope of the MOOCs that it offers. The platform offers courses across 16 different categories of academia which is three more than FutureLearn can boast. Many platforms tend to focus on courses relating to technology, so if you want to take a course like "Ancient Egyptian Civilization," edX will probably be your best bet.

The biggest problem with edX is the lack of any sort of accredited degree. While other platforms like Coursera offers a few degrees, edX's only accreditation takes the form of its MicroMasters program which requires you to go through the admissions process at a university. Another knock on edX is its sub-par social features. Coursera and Udacity both have a reputation system which rewards and recognizes students who positively contribute to the community – edX noticeably lacks this type of feature.
edX's fee structure is similar to Coursera's. You can audit courses for free, but you won't have access to the whole experience. You don't get any sort of certificate for finishing a course you audit, so you will have to pay a fee if you want to show off your progress to your peers or employer.
edX is a nonprofit company that was founded in 2012 by Harvard and MIT, and it currently partners with top institutions all over the world. One aspect of edX that makes the platform stand out is that its technology is open-source – this means that partner institutions can improve and add features that benefit the audience they are trying to reach.

Udacity
Best for: Those who want to pursue a career in a technical field without attending college
Udacity doesn't offer MOOCs on the scale that Coursera and edX do, and its primary partner institutions aren't universities (the only university it partners with that's ranked in the top 100 worldwide is Georgia Tech). Instead, Udacity's main partners are corporations like Google, Amazon, and IBM Watson. Udacity's pricing is somewhat less complicated than Coursera's – most courses are free, but you have to pay for Nanodegrees. For example, if you want to take an introductory course to programming, you can do so for free, but if you want to turn that into a Nanodegree, you will have to pay a fee.
Unlike Coursera and edX, Udacity only offers MOOCs that relate to the tech field – the platform is unapologetically a product of Silicon Valley. One of its most intriguing features is its Nanodegree program. On the surface, this program is similar to the specializations offered by Coursera and edX, but there is an underlying difference to take note of: Udacity's Nanodegree programs aren't designed solely to educate, but instead, they aim to launch students into a career. Udacity even guarantees that those who purchase a Nanodegree Plus program will find a job within six months or the cost of tuition (one Nanodegree costs about $1,200) will be refunded.
Udacity was started by Stanford Professor Sebastian Thrun after 160,000 people signed up for a course he and Peter Norvig offered ("Introduction to Artificial Intelligence"). Sebastian Thrun was a Google VP and was a pioneer in autonomous car technology. Udacity's mission is to "bridge the gap between real-world skills, relevant education, and employment."

4. Comparison between Moodle and OpenEDX

4.1.1 Intended Audiences

Although both platforms were initially designed with educators in mind, Open edX puts the power back in the hands of instructors and allows rapid and frequent changes to the course or site by the instructor. Additionally, **Open edX was built for the MOOCs world of online learning**, whereas Moodle was originally built for more traditional models as an online learning version of a classic classroom.

While many of us are familiar with a traditional classroom, and can therefore understand the viewpoint of Moodle, it is important to understand a bit about MOOCs in order to see the difference between Open edX and Moodle. As opposed to Moodle's perspective on creating a platform for classrooms between 5-30 as is traditional in schools, Open edX, with its MOOC perspective, seeks large-scale audiences and are geared for anywhere from one to one million users.

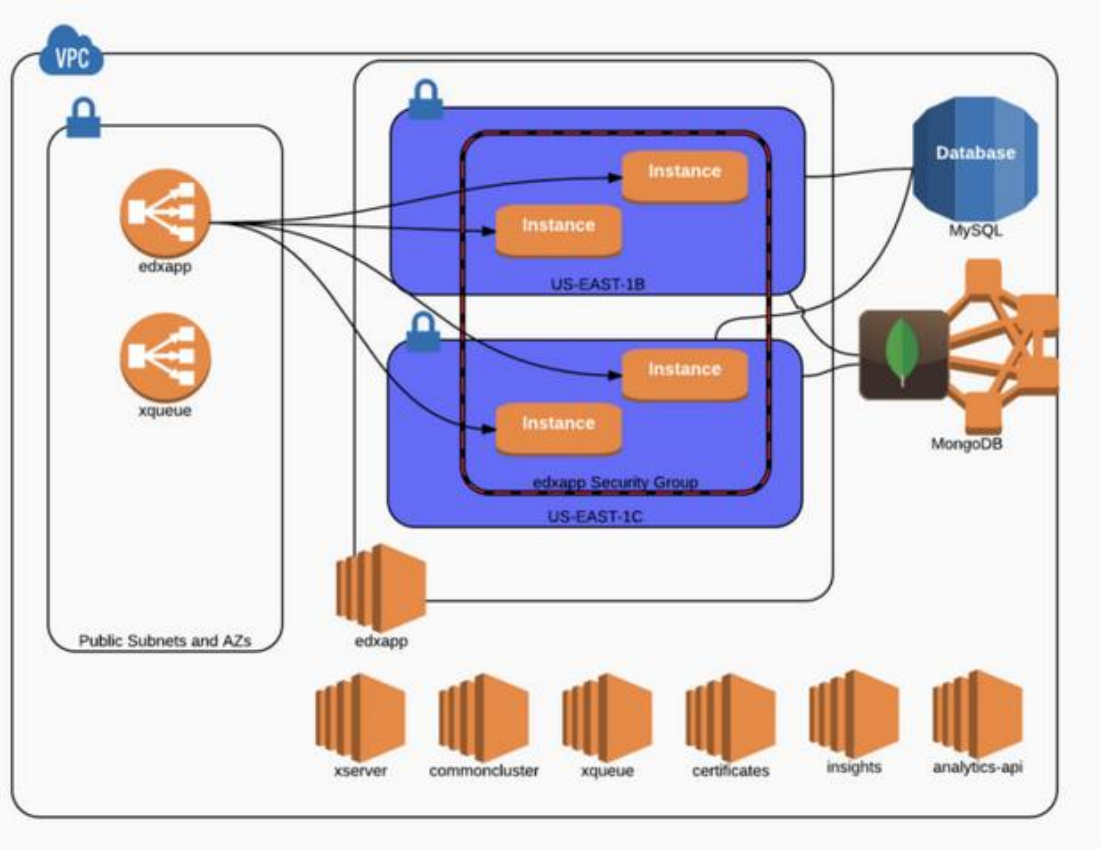
MOOCs were also created to have more interactive participation than a simple online classroom, so Open edX allows you to add interactive elements via XBlock plugins more easily than you can with Moodle. Although both Moodle and Open edX allow you to add features like videos, quizzes and exams, Moodle does have a larger library of plug-ins available out of the box for users. But where Moodle wins in volume, Open edX wins in the quality arena, with XBlocks made to seamlessly integrate with the authoring experience and far easier to design.

4.1.2 Communities

Community is an important part of choosing a platform, and both Open edX and Moodle have different but active communities that drive the direction of platform development. The Moodle community grew out of its base of K-12 education, whereas the Open edX community emerged from higher education, with the idea of sharing more complex and advanced information via MOOCs.

4.1.3 Ease of Use

Moodle is a stable platform but some users find the functions a bit unnatural, and the look of the site can feel a bit dated. Additionally, Moodle has chosen not to prioritized mobile-friendly development or APIs, which makes things difficult for some users. Open edX has better usability and uses APIs which make for even easier use. Additionally, services such as Appsembler's Tahoe exists on Open edX to help take care of the technical aspects, and allow even easier use of the Open edX platform.



Credit: Open edX architecture by Feanil

Fig 13: Overview of OpenEdX differentiating digital architecture

4.1.4 Open edX Success Stories

Sometimes the differences between two products are made clear by who is using the products. Prestigious institutions like MIT, Harvard, and Stanford, as well as large innovative companies like Google, Amazon Web Services, and IBM are all using Open EdX. Moodle's users include State University of New York, the London School of Economics, and companies such as Shell.
While both Open edX and Moodle have a large customer base, in recent years some customers have chosen to move from Moodle to Open edX. For example, CognitiveClass.ai (formerly known as Big Data University) has switched from Moodle to Open edX.

4.1.5 Final Thoughts

Both Moodle and Open edX are excellent platforms and each have their advantages.

5. Annex 1: Other LMS

LatitudeLearning

LatitudeLearning is a “freemium” LMS that is free to use for up to 100 learners and then starts at 55 cents per user per month.

It’s a largely web-based system and targets corporate training and B2B environments. Clients include Chrysler, GM, and the American Board of Emergency Medicine.

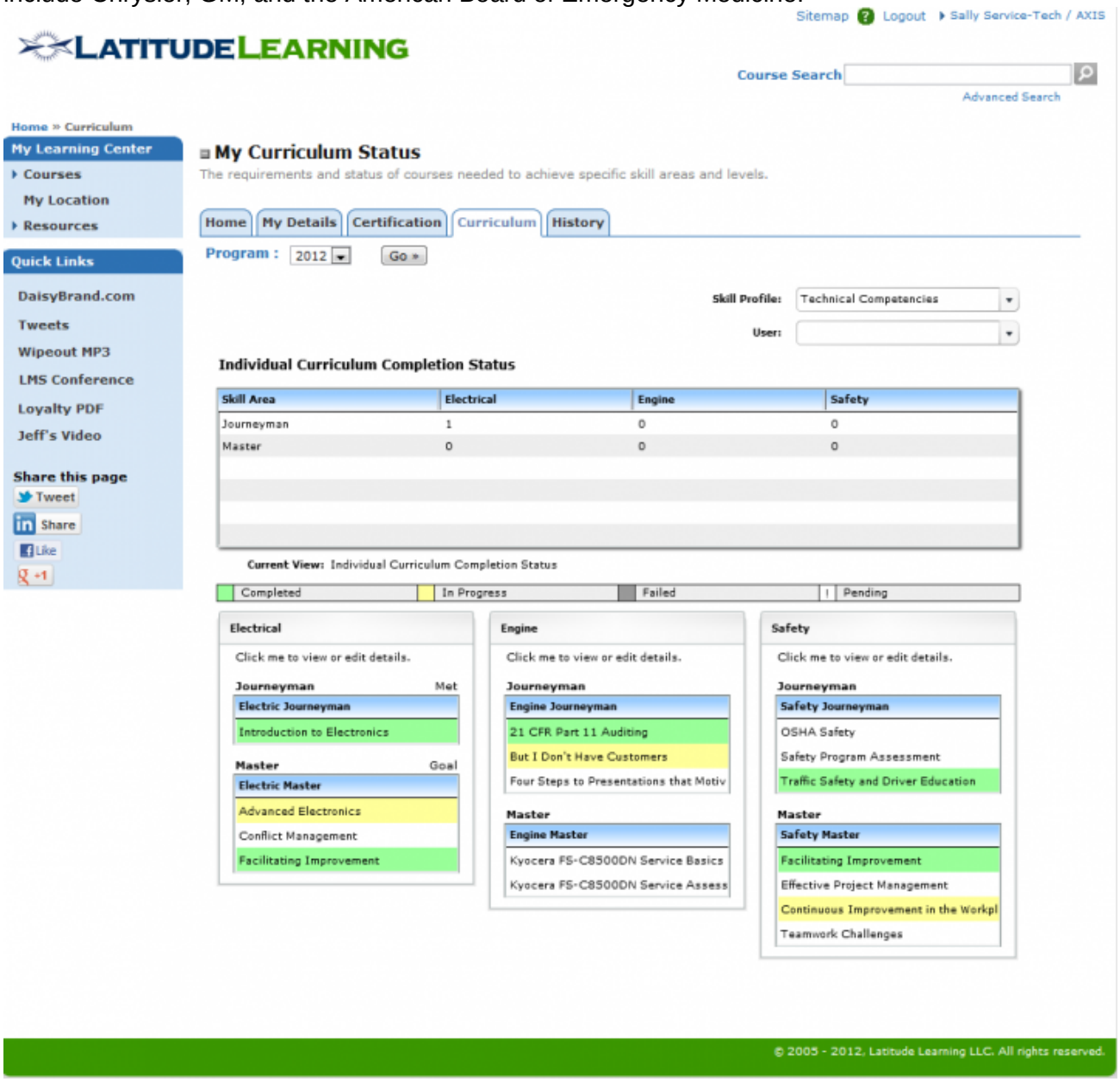


Fig 14: A course in LatitudeLearning LMS

Differentiating features

LatitudeLearning includes certification, integration with WebEx and GoToMeeting, as well as collaborative whiteboards, and support for nine different languages. It also has extensions (such as eCommerce) that can be purchased.

Considerations

LatitudeLearning’s focus on corporate training sets it apart from more academically focused solutions. For businesses and training professionals this focus is definitely a pro. However, LatitudeLearning does not yet have mobile support, or a third-partycontent library, and its add-ons can be costly if you need to extend any of its functionality.

Dokeos

Dokeos is another open–source solution, this time built on PHP instead of Java. It originates from France, and has seen wide adoption there and in Belgium (as well as 60 other countries comprising over 6,000 total installations). Dokeos' open-source version is only available as a download, rather than being cloud-based.

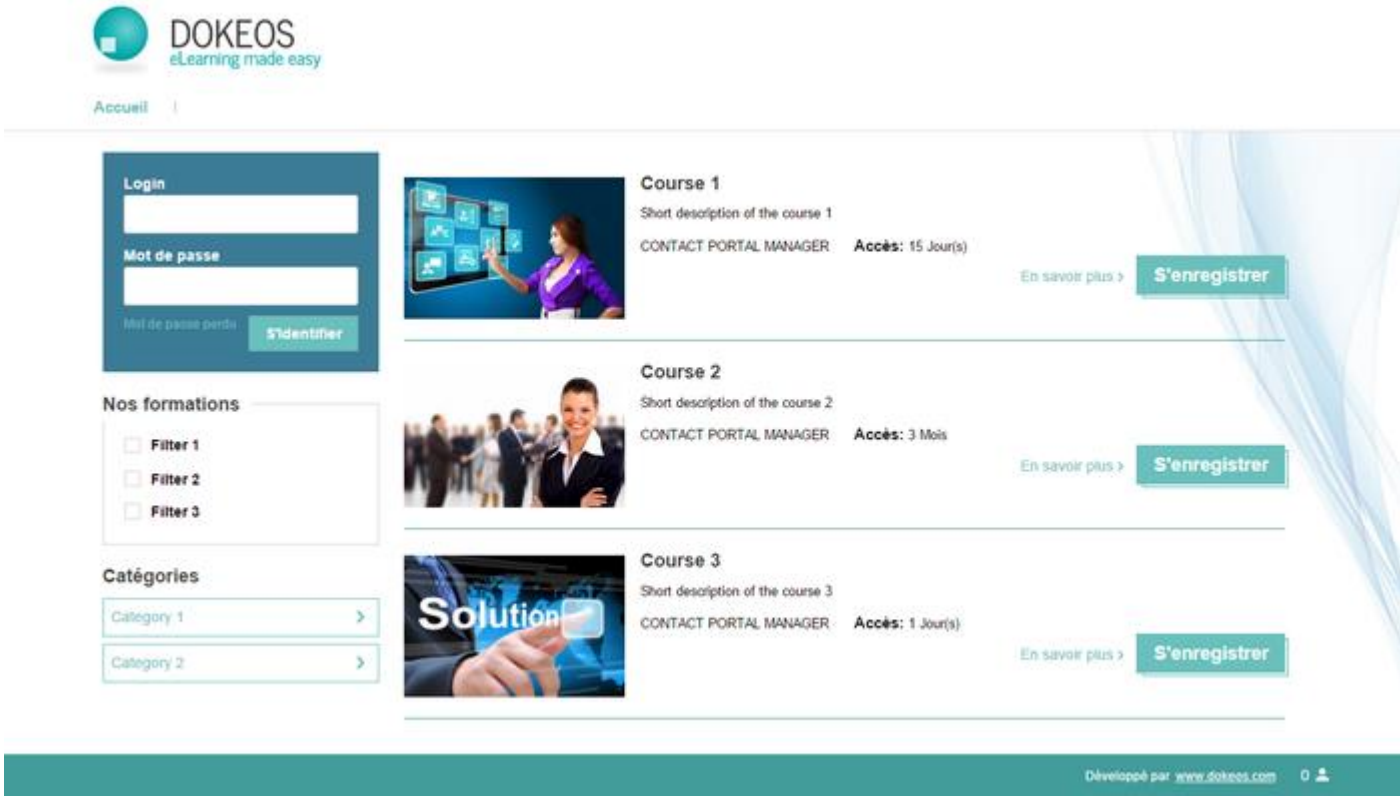


Fig 15: A course in Dokeos LMS

Differentiating features

Dokeos boasts a built-in course authoring tool, as well as premade quiz templates, private groups, and a chat tool.

Considerations

With Dokeos' "Oogie Rapid Learning" feature, users can convert both PowerPoint and OpenOffice Impress to SCORM. Dokeos does suffer from difficulty in customizing user levels, and users have reported that response times for questions/issues on the forum are long so that support may be an issue.

Schoology

Schoology is a freemium LMS aimed primarily at educators (similar to Blackboard's CourseSites). It's web-based and the Basic Package is free for instructors, with the option to upgrade to an Enterprise Package if you want specialized support or integration with a student information system (SIS). Schoology does not share the prices for the Enterprise Package on its website.

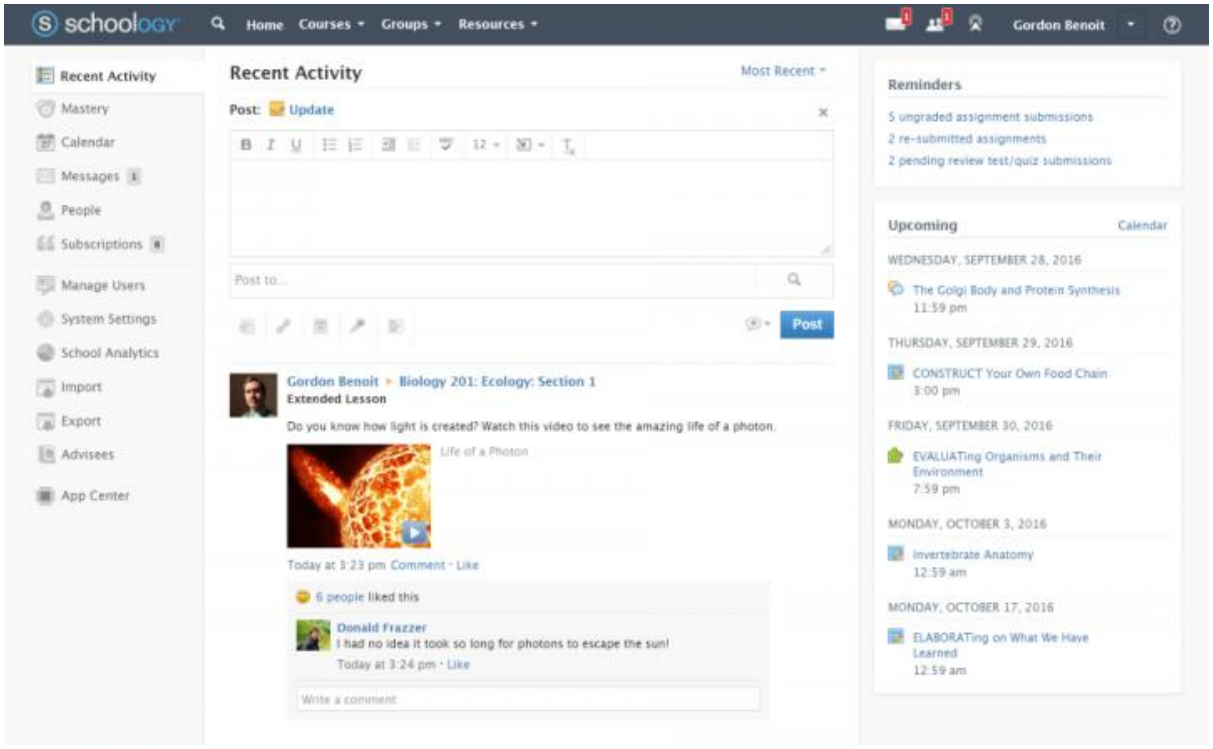


Fig 16: A course in Schoology LMS

Differentiating features

Stand-out features for Schoology include mobile access, Google Drive integration, content creation tools, and access to a library of public courses and other content.

Considerations

Schoology's mobile functionality and workflow are highly praised in reviews, and the modern interface and integration with cutting edge cloud apps helps to bring it out of the pack, though it doesn't include private messaging between students.

ILIAS

ILIAS is an open–source, web-based LMS developed at the University of Cologne in Germany, where it enjoys a wide user base of installs. Its user base (5,000 current installations) is a mix of universities and government and defense organizations, primarily in Europe.

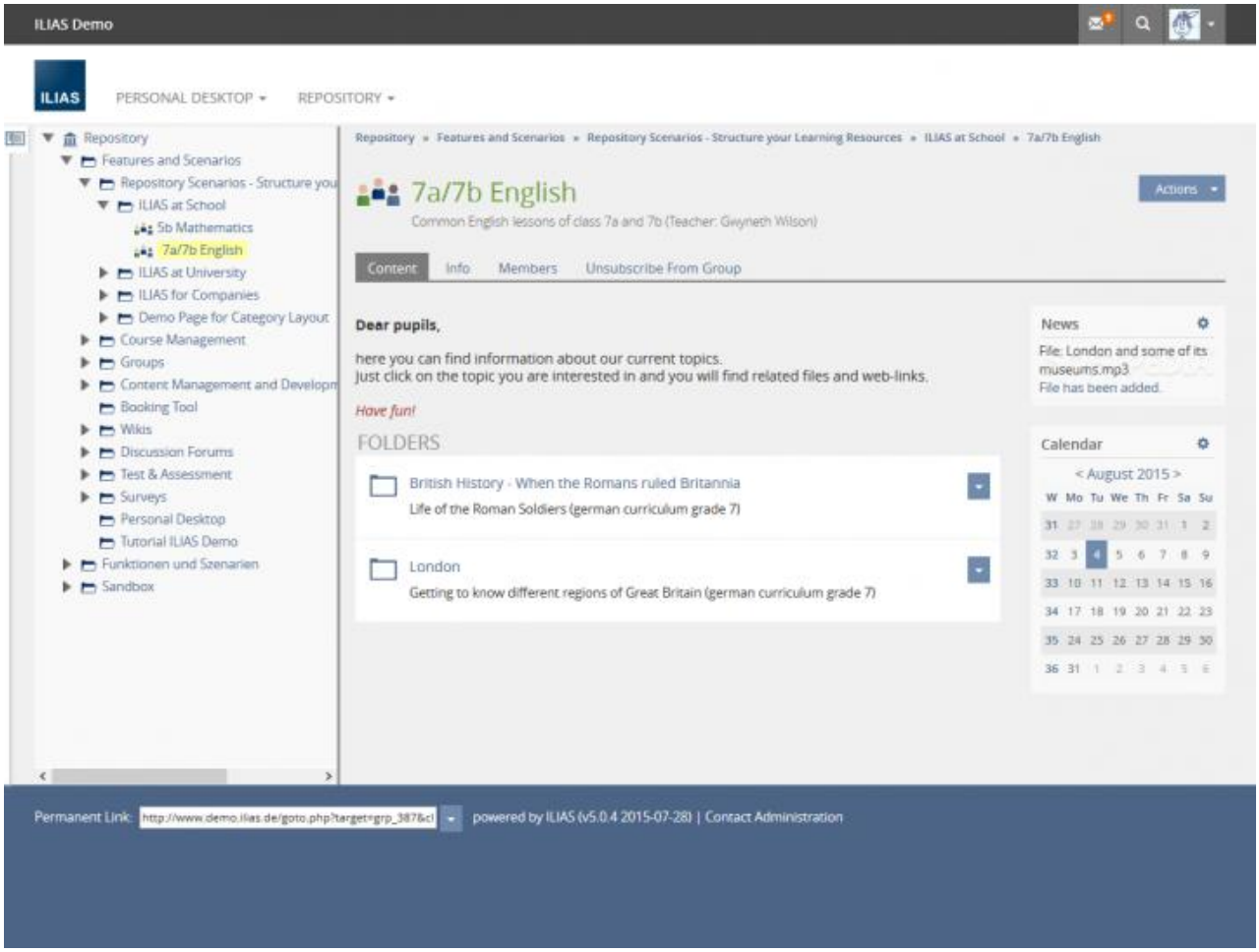


Fig 17: A course in Ilias LMS

Differentiating features

ILIAS is security certified by NATO and used in NATO's high-security intranet as well as by several national defense departments and armed forces. Additionally, the system allows users to set different user roles and control access to separate parts of the software.

Considerations

ILIAS has a long pedigree (13+ years) and has managed to retain a growing user base and coherent code-base, so if you're looking for something with strong security, that's likely to be around for a while, this may be the LMS for you. Additionally, an active community that even sponsors its own annual conference ensures support issues will be dealt with. However, it suffers from a clunky interface design, and some features included with other LMSs (such as mobile integration) require the installation of plug–ins or other add-ons with ILIAS.

ELMSLN

Similar to LMSs that are built on WordPress, ELMSLN is a free extension for open–source content management system Drupal. ELMSLN has been installed in over 12,000 Drupal systems, including those of Penn State University and University of Wisconsin-Madison.

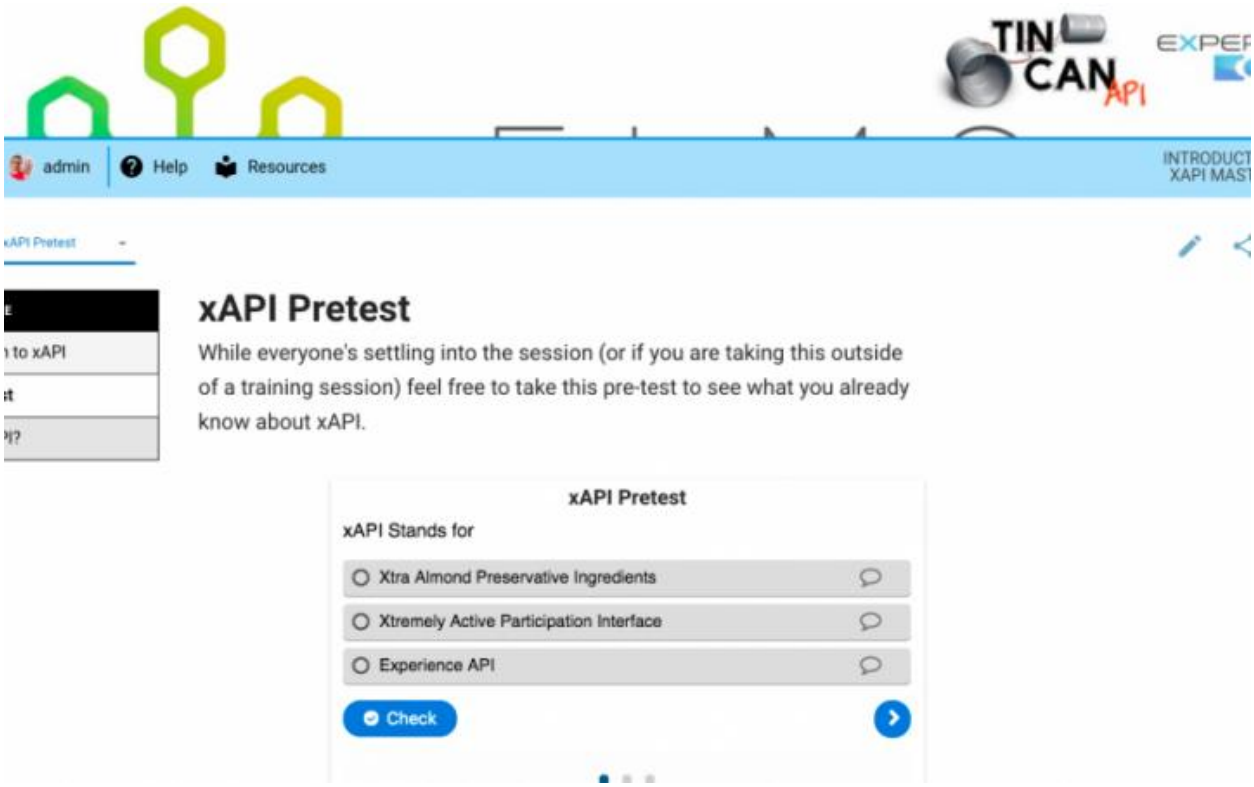


Fig 18: ELMSLN pretest

Differentiating features

ELMSLN is a very active open-source project, with a large community of developers working on it and the advanced functionality it offers reflects this, including Open Badges support and Tin Can/xAPI integration.

Considerations

ELMSLN requires fluency with Drupal. Yet an active development community, and frequent updates will ensure a useful, feature-rich system if you already know, or are willing to learn, Drupal's back end.

Myicourse

Myicourse allows users to create online “colleges” which house multiple courses. Myicourse provides an advantage to those who wish to make their courses public, creating and running them is totally free (Myicourse makes money through ads, without adds it is free up to 100 students).

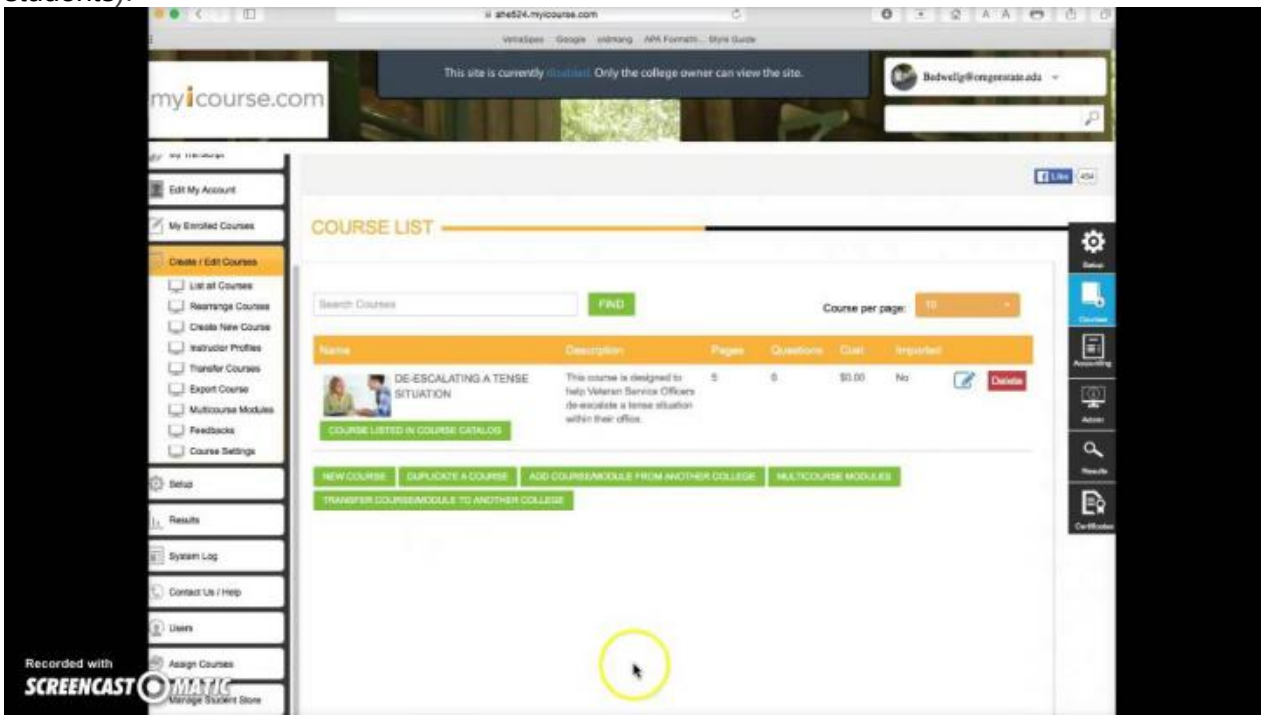


Fig 19: Example of a public Myicourse college

Differentiating features

White–labelling, as well as the ability to sell courses (Myicourses takes 10%), makethis system as a good option for corporate training. Being able to track student traffic, course sales, and more also adds a layer of quantitative detail that makes it a great fit for those offering certifications.

Considerations

If your course content is sensitive and not something you want online for everybody to see, the free version may not be for you, as your material *will* be posted publicly. The free version of this tool is limited, and students will have to deal with banner ads. However, the tool itself is straightforward with built-in course creation functionality.

Chalkup

Chalkup is an LMS that doesn't like calling itself an LMS. The origin story on Chalkup's website suggests it was born out of a frustration with traditional learning management systems. Whatever you call it, it has the features you'd expect from any good LMS (course creation, online hosting, Dropbox-esque submissions, etc.).

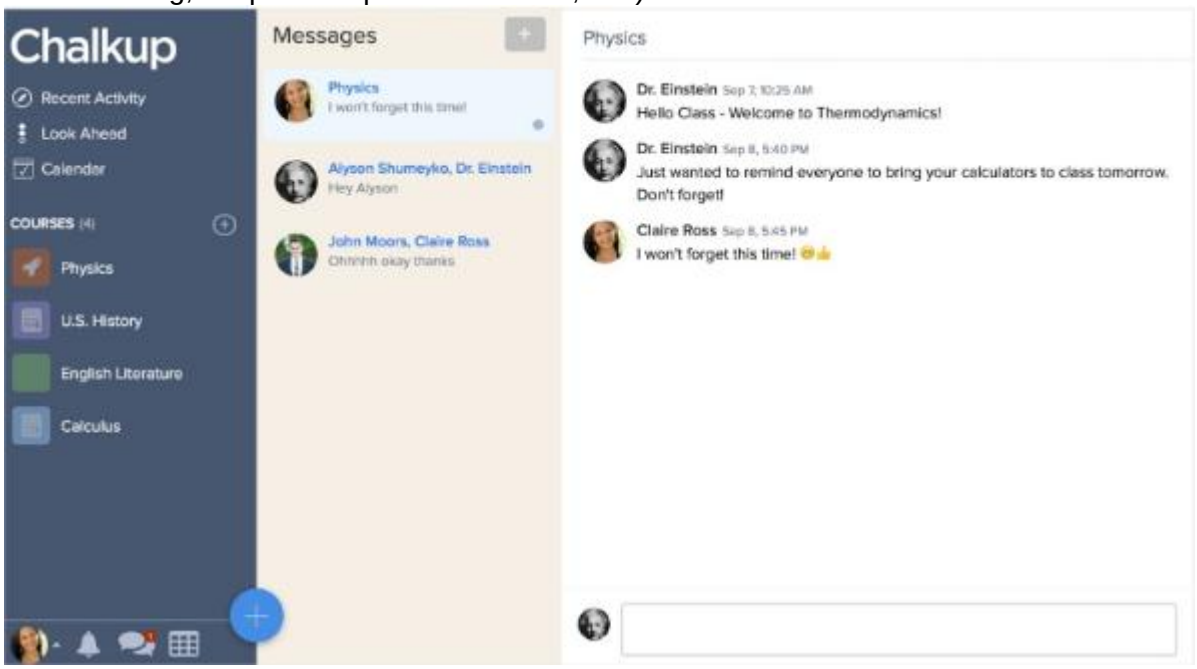


Fig 19: Chalkup's instant messaging feature

Differentiating features

Instructors can grade projects from in-app rubrics. Chalkup also features an instant messaging function with group and direct options.

Considerations

Chalkup has Google Drive integration, which is useful for many businesses. It's primarily used by schools, specifically K-12, but there's nothing about it that should inherently bar it from being used by corporate trainers.

Chamilo

Chamilo is a free LMS developed in Spain. It's open source, cloud-based, and designed for the corporate world. It's an offshoot of Dokeos, which does not have a free version.

Chamilo

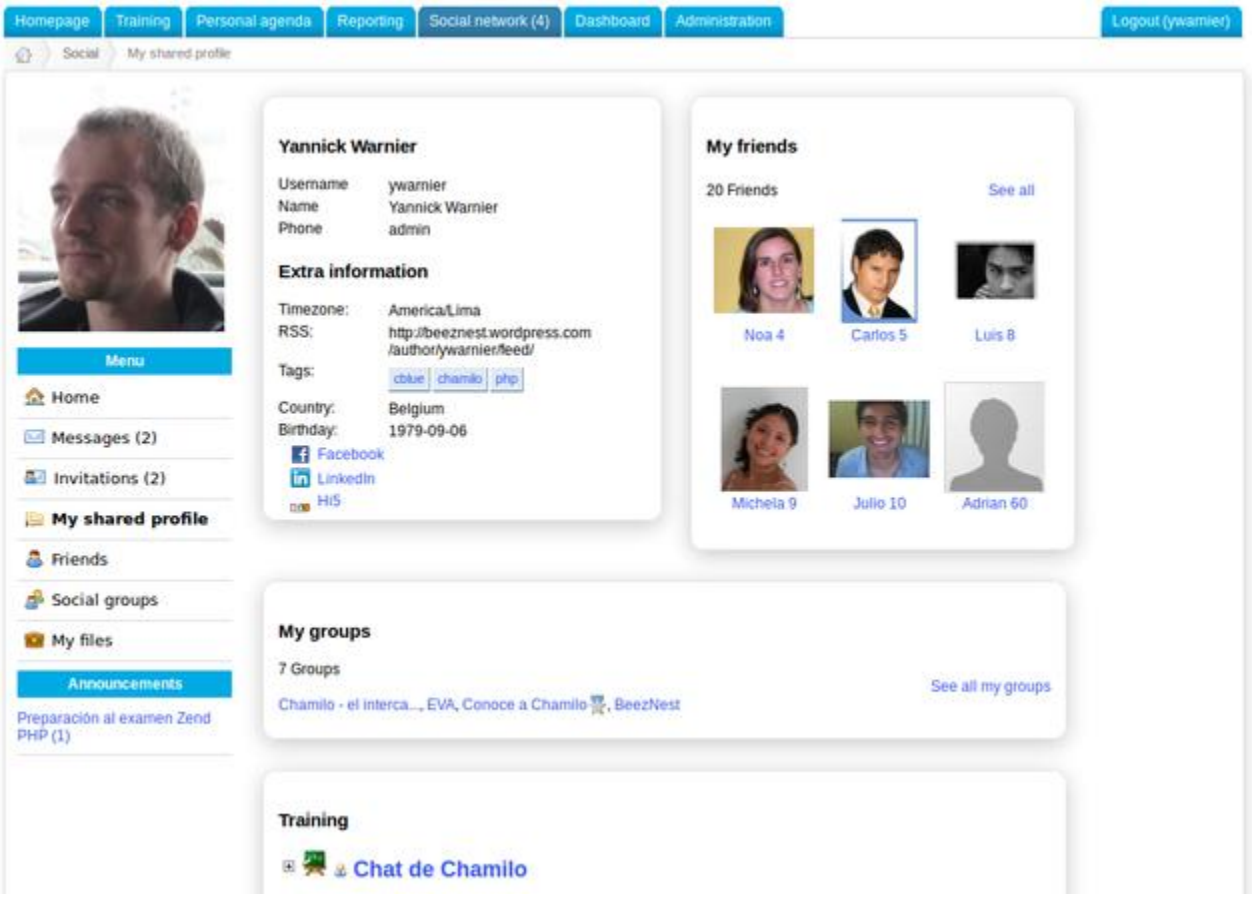


Fig 20: A Chamilo profile page

Differentiating features

Chamilo is a customizable system with an edit-friendly source code. It has user customization options, including profile pages, which can be helpful for social learning. Thanks to its Spanish origins, it also comes in several languages, including Spanish, English, French, and Italian, so if you're working in English, you have options.

Considerations

Chamilo is a clever system, however, it doesn't add much to the original Dokeos. The open source code has a strong online support community, but the memory cost is fairly large since it comes with a lot of files.

Chamilo reviewers recommend to avail yourself of the tech support Chamilo offers.

6. Annex 2: Other MOOC platforms

FutureLearn is a private company wholly owned by The Open University (UK), comprising invited universities, mainly from within the UK.
Iversity is a MOOC platform set up with sponsorship from a German regional government, offering online courses by institutions that are mainly but not exclusively based in German speaking countries. The platform has more than half a million enrolled users.
Miríada X was started in 2013 by the Santander Bank and the Spanish telecom company, Telefónica, through the RedUniversia (a network of universities in Latin America) and Telefonica Digital Education. It is based on the open-source platform, WEMOOC. Miríada X offers courses from 45 universities based in nine countries (Spain, Colombia, Chile, Argentina, Peru, Mexico, Brazil, Puerto Rico, Dominican Republic and El Salvador). More than 1,000 teachers are involved and 195 courses are offered.

MOOC platforms aiming to enable employability

Some MOOC platforms in Europe have been specifically set up to provide courses that will increase learners' employability. Ideally, successful learners should have their credentials for these MOOCs recognised by employers.
The initiative **MOOCs for Web Talent Network** was launched in 2014 as part of "Startup Europe", the European Commission action plan that aims to strengthen the business environment for Web entrepreneurs in Europe. Activities include networked discussions around the topic of certification and recognition of MOOCs to increase the employability of the European workforce.
The French MOOC platform **Unow** was launched in 2012. It offers project management and support to academic institutions and businesses wishing to run MOOCs. According to their website, they have partnered with 18 schools and companies, for example Ecole Centrale de Lille, Université Montpellier 2 and Telecom Bretagne.
In Germany, **openHPI** was launched in 2012 as an initiative of the Hasso Plattner Institute at the University of Potsdam (Allgaier, 2013). It offers courses in both German and English, and according to their website, has around 200,000 learners worldwide. The MOOCs are intended to help learners progress in their careers.
In Spain, a public-private partnership resulted in the launch of **Google Actívate**, an initiative providing a series of MOOCs to teach digital skills to young unemployed people in Spain. The aim is to contribute to solving the unemployment problem in the country. The lead partners in this initiative are Google Spain, the Spanish Ministry of Industry, Energy and Tourism, their business school EOI, and a public corporate entity promoting the development of the Information Society, Universidad Complutense de Madrid and Interactive Advertising Bureau (IAB). Google announced towards the end of 2014 that "more than 148,000 people have registered for Activate with 13% of participants earning a certificate" and that more than 19,000 learners are already certified in the area Digital Marketing, Big Data, Ecommerce, Mobile App Development or Cloud Computing. The certificate is obtained after passing 13 examinations and is awarded by either the EOI, Universidad Complutense de Madrid or the Interactive Advertising Bureau. The certificates can be displayed on the awardees' LinkedIn profiles.
OpenClassrooms is a French provider of open, online learning that enables learners to accumulate certificates towards degrees in IT and business topics that are recognised by the French State. "Premium" membership costs 20 EUR per month, but is free for job seekers in France. It offers access to all courses, exercises and paths, certificates of achievement, self-paced courses, videos and e-books to download, and priority support via email.