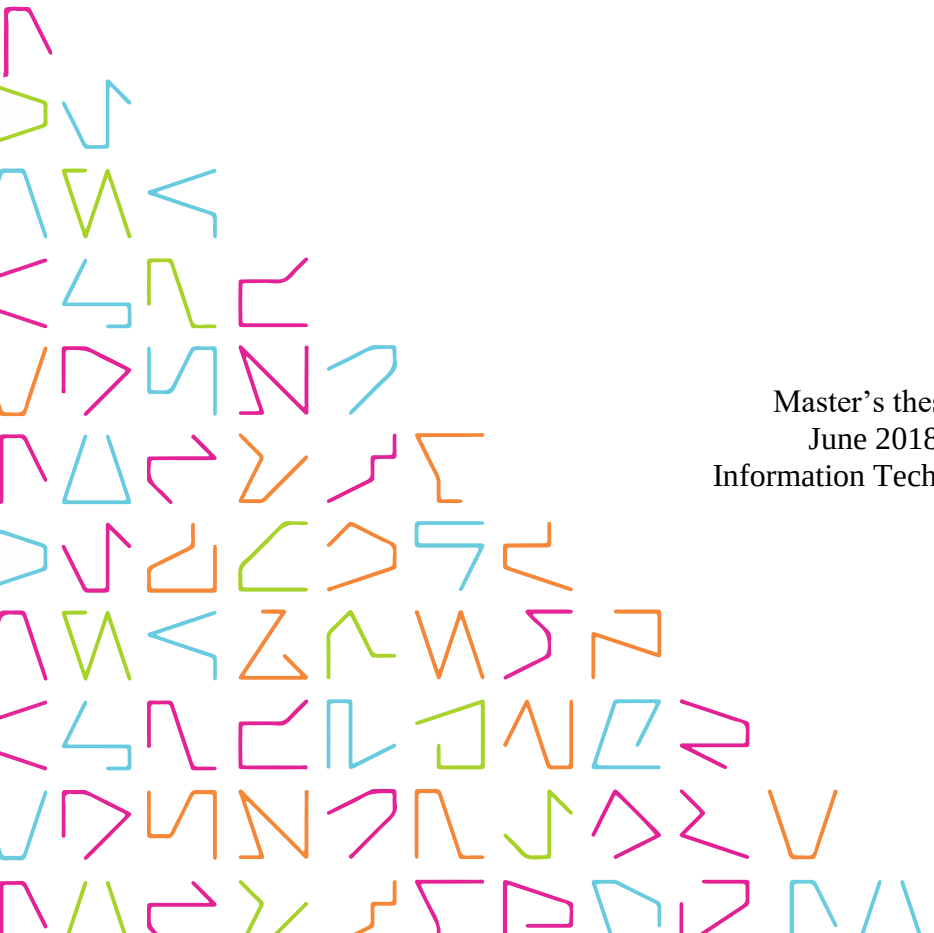
TAMPERE UNIVERSITY
OF APPLIED SCIENCES

TEACHING WITH LEARNING MANAGEMENT SYSTEM

Tutorial for Moodle

Ana Daniela León Becerra



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ABSTRACT

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ANA DANIELA LEON BECERRA
Teaching with Learning Management System
Tutorial for Moodle

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The aim of this thesis was to study Learning Management Systems and the options to improve it as a tool outside the traditional classroom. This thesis compares the educational system of Mexico and Finland specifically on higher education level. I surveyed teachers from both countries as a part of this research and case of study.

The idea of this topic came by tying to combine my work experience on the education field and technology methods for teaching and learning. With technology there will always be a need for improvement and about education teaching there will always be a need for training.

Educational technology as a teaching method requires double effort. Teachers must learn how to use the tools and then decide how to reach the teaching objectives. Learning management systems have been adopted at universities but are not totally implemented by the teachers. This work pretends to give one of many options that teachers or students can develop when they choose an open source solution.

Key words: learning management systems, educational technology.

CONTENTS

ABBREVIATIONS AND TERMS

CSS	Cascading Style Sheets
GDP	Gross Domestic Product
LMS	Learning Management System
OECD	Organization for Economic Co-operation and Development
PHP	Hypertext Preprocessor scripting language
SEP	Secretaria de Educación Pública (Ministry of Education)
TAMK	Tampere University of Applied Sciences
TUT	Tampere University of Technology
UABC	Universidad Autónoma de Baja California
US	United States
USD	United States Dollar
VLE	Virtual Learning Environment

1 INTRODUCTION

Using technology in education has been a key to development and creation of educational technologies for everyday use in classrooms. Implementation of new technologies has taken place along with changes in the teaching methods and even the way of thinking about learning and teaching. Educators have found a world of possibilities to enhance their teaching by integrating new technologies as a resource in the process of teaching and learning. This has allowed them to promote and facilitate a creative attitude among students by adapting the materials and resources to their needs and possibilities.

Education technology material should be a basic teaching tool in the educational system which should include a pedagogic model specialized in training teachers for better results. Students should be able to find and work with different technology sources that go from a library website to an advance search for researches. Also, the use of different educational software help the students to learn in their own speed according to their own abilities and skills helping to process information better.

Nowadays new technologies have an important effect on people´s work, study and entertainment life, causing a huge effect in society. In Mexico, changing the traditional teaching system is a challenge, technology has been introduced slower than the speed of development of the technology itself.

In other countries, like Finland, the use of technology in education has been the key to the development of distance education and the creation of educational technologies for everyday use in the classroom. The implementation of new technologies was done together with changes in teaching methods, that´s why the importance of technology should be part of this process.

The benefits of including technology as a learning tool are many, the students are able to choose the schedule and place of studying because it is always available and every day the online information is more complete and that gives to the students the opportunity to improve their level of education.

There is still a generation barrier and objection among teachers, which prefer traditional learning methods claiming that students can just copy information from internet and not understand nor study anything, including the poor knowledge about some software without any personal help.

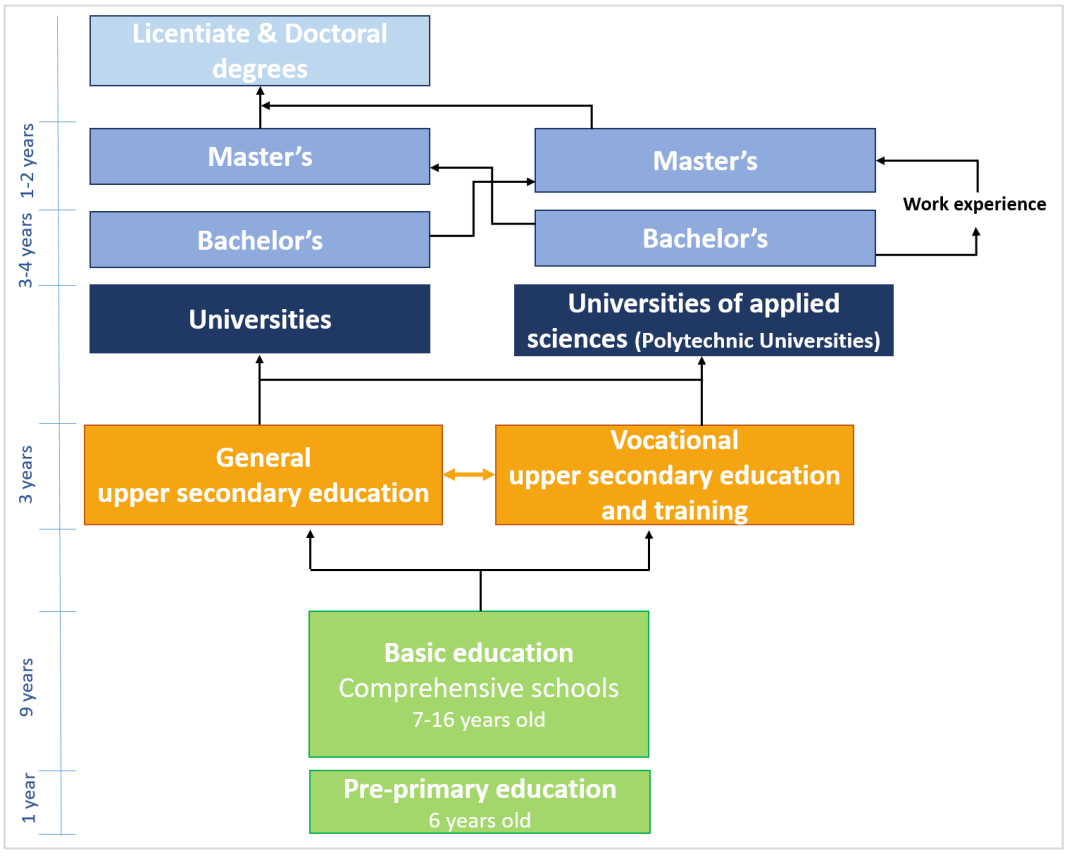
Nowadays there is a need to learn, use and know the options of technology as a studying tool, but there is also a need to focus on teachers' professional training and keep updating them to maintain the necessary level that the future students require.
Educational technology refers to the combination of technology with educational theory and the use of this term can be quite large so it is important to mention that in the next chapters we will refer to educational technology for learning management systems, for the purpose of improving the quality of education.

2 EDUCATION SYSTEMS DIFFERENCES

2.1. Education System in Finland

In Finland education is free at all levels from pre-primary to higher education. The objective is that all people must have equal access to high-quality education and training.

The picture 1 below shows the structure of the Finnish education system. There are no dead-ends in the Finnish education system. All programs provide eligibility to move on to further education. The only national assessment is the matriculation examination, which is taken at the age of 18-19 by general upper secondary school students. After completing an education program or training program, every student can continue to higher level of education.



PICTURE 1. Education System diagram

Students from higher education in Finland can study Bachelor´s and Master´s Degrees and scientific or artistic postgraduate degrees, which are the Licentiate and the Doctorate degrees. Students first complete the Bachelor's degree, after which they may go for the Master's degree. The target time for taking a Master's degree is generally 5 years. The average time for taking a Master's degree in Finland is, however, six years.

The students have been supported with financial incentives, loans and personal study plans, helping them to complete their studies faster and reduce graduation times. Degrees from a polytechnic university provide students with practical professional skills. The general requirement for admission to polytechnics is the completion of general upper secondary education or vocational education and training. For students, choosing a Polytechnic is mainly based on entrance examinations, school achievement and work experience. Degree studies at polytechnics give a higher education qualification and practical professional skills. All degree studies include practical on-the-job learning. The extent of polytechnic degree studies is generally 3–4 years of full-time study. It is further possible to take a polytechnic Master's degree after acquiring a minimum of three years' work experience. The polytechnic Master's takes 1.5–2 years, and it´s equivalent to a university Master's degree. (Finnish National Agency of Education, 2013)

2.1.1 Schools

Finland has 14 universities and 24 universities of applied sciences. A university is considered a higher education institution that conducts and emphasizes scientific instruction and provides education based on research. Universities interact with society and promote the effectiveness of research results. The total number of university students in Finland were nearly 170,000 in 2012 with more than 19,000 being new students. The total number of graduates was 38,200, which was considerably higher than 2011.

University of applied sciences, also known as polytechnic university is considered an institution which based education on labor market needs and practical approach. Polytechnics work more with research development. Since the beginning of the year 2015 they have had the status of independent legal entities and have operated as limited companies. The State is the primary financier of the polytechnics.

Universities have had the status of independent legal entities and have been separated from the state. In spite of that the state continues to be the primary financier, the government funding covers about 64% of university budgets. In addition, universities are encouraged to acquire private donations. (Study in Finland, 2016)

2.1.2 Teachers

Teachers are recognized as keys to quality in education. Highly educated Teaching is an attractive career choice in Finland. Most teachers are required a master's degree.

The teacher education institutions can select the applicants most suitable for the teaching profession. University teachers are generally required to hold a Doctoral or other postgraduate degree. Teachers at polytechnics are required to have either a Master's or a postgraduate Licentiate's degree, depending on their position. They must also complete pedagogical studies.

University rectors must hold a doctorate or a professorship. Most commonly the rector is appointed from among the professors of the university. In polytechnics, rectors are required a postgraduate Licentiate's degree or doctorate and have administrative experience.

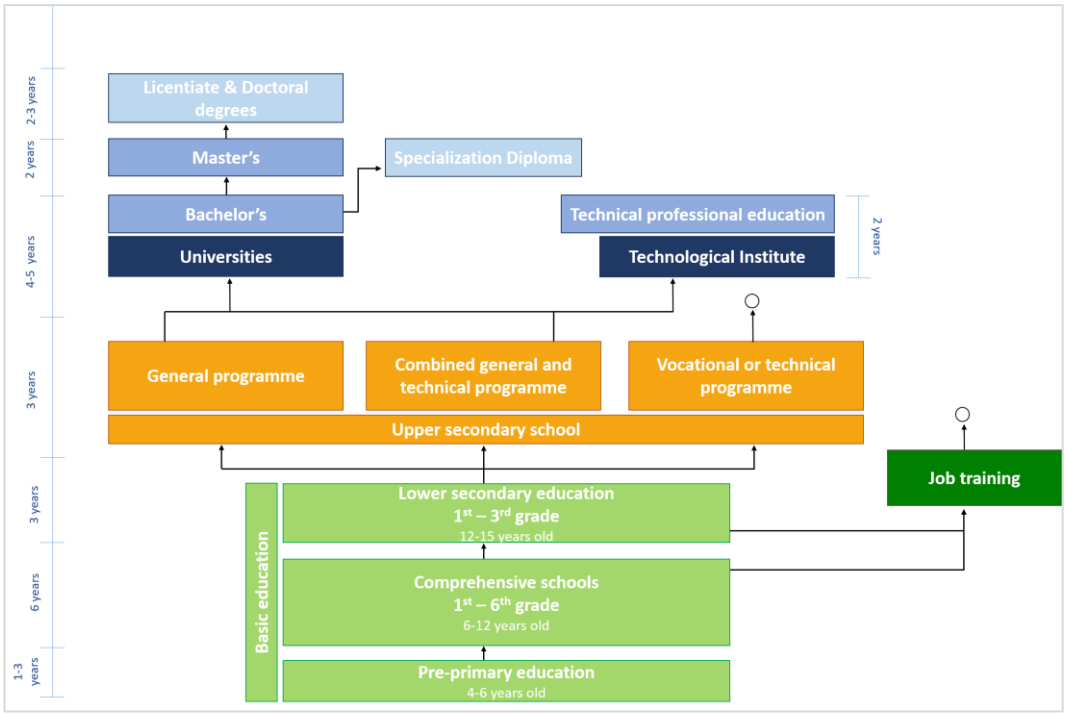
At most levels of education the teachers are required to participate in in-service training every year as part of their agreement on salaries. Finnish teachers consider in-service training as a privilege and therefore participate actively. The State also provides in-service training programs, primarily in areas important for implementing education policy and reforms. The education providers can also apply for funding to improve the professional competence of their teaching personnel. Therefore continuous attention is paid to both their pre-service and continuing education. (Finnish National Agency of Education, 2013)

2.2. Education System in Mexico

In Mexico the purpose and right to education are established in Articles 3 and 31 of the Political Constitution of the United Mexican States and its Regulations in the General Education Act.

Article 3 of the Mexican Constitution reads as follows:
"Everyone has the right to receive education. The state-federal government, states, Federal District and municipalities shall provide pre-primary, primary and lower-secondary education. Pre-primary, primary and lower-secondary education conform compulsory basic education. The education provided by the State will harmoniously develop all the faculties of the human being and will in him promote, at once, a love for the Nation and the awareness of international solidarity, independence and justice."

However, the students have notorious contrasting results from different regions. There are zones with a much higher educational backwardness despite of the constitutional right of everybody to receive free education.



PICTURE 2. Education System in Mexico diagram

The National Educational System is composed of the types: Basic, Middle Higher and Higher Education. Above picture 2 is a diagram that shows the structure of the Education system in Mexico.

Basic education is composed of preschool, primary (comprehensive) and secondary (lower secondary) levels. The Middle-Higher (upper secondary) type includes the high school level, as well as other levels equivalent to it, and vocational education that does not require high school degree.

The higher education type is the one that is given after the high school or its equivalents. It includes Bachelor's degree, Specialization, Master's and Doctoral, Technical professional degrees, as well as Teacher training schools for basic education.

The technical professional education degree normally takes 2 years. A Bachelor's degree generally 4-5 years. For Master's and Doctoral studies are required to have a Bachelor's degree and those studies take 2-3 years that will depend on the programs of different universities. A specialization diploma takes 1 year. (SEP, 2016)

2.2.1 Schools

The type of institutions of higher education in Mexico are varied, those can be classified as, public autonomous universities, public state institutions, technological institutes dependent on the federal government and private independent institutions.

Public universities and technological institutes of higher education offer affordable education to all Mexicans. Tuition is free, but there are fees for some administrative tasks. In some of the technological institutes, for example, where the demand for education is high, the total amount of fees per semester it's near to 150€. In some of the state public universities, semester fees are even lower. Private universities, however, vary in tuition prices, some charge fees that are comparable to or higher than out-of-state tuition charged by U.S. universities.

There is no specific definition of the characteristics of University and Technological institutions but there are two clearly differences. Public Universities are attended by the

Undersecretary of Higher Education and Scientific Research while public technological institutions depend administrative and academically of the Undersecretary of Education and Technological Research. The difference is that the majority of public universities have autonomy and, therefore, the Undersecretary that attends them helps to coordinate functions but does not administer them neither intervenes academic life, other than promoting the institutions to achieve and improve them.

In addition, each sub-system constitutes a relatively closed circuit. It means, for example, there is no system of equivalences of credits, areas, majors nor diplomas that allow to make transfers from one sub-system to another. Therefore it is extremely difficult to change a university student to a technological institution or vice versa.

One important sub-system is the one of private institutions. Private institutions of higher education have 27.6 percent of the undergraduate enrollment and 36.5 of the graduate enrollment in Mexico. In the last 25 years the private universities have been rising 75% and the students around 50% more. (SEP, 2016)

2.2.2 Teachers

In Mexico there is no standardization of teaching positions and levels, institutions have their own policies for hiring and their own admission requirements. There can be 3 categories of teacher's contracts: full time, part-time and by hours/lesson. There are around 330 thousand teachers of higher education in Mexico from which 25% are full time teacher and most of them work for a public institution. From those full time teachers 70% have a master or post grade degree in public universities and 65% in private institutions.

The academic level qualification in Mexico, in general, is low compared with developed countries. For most of the higher education teacher positions a pedagogical degree is not mandatory but normally the institutions request a degree related to the subject they want to teach. The majority of the teachers have a bachelor degree as the maximum level of studies followed by a 15% of teachers with master degree and around a 3% with a doctoral degree. (UNESCO Resources, 2006)

2.3. Social and cultural differences

Cultural differences are a very important fact, mostly when is about online education and the idea is design material accessible to worldwide learners. Also to compare two educational systems from two different countries, there is a need to understand how culture affects the results, the change from traditional classrooms to e-learning environment can have a different impact on both cultures.

Mexico is a country that had been trying to introduce different projects to develop technology into education and society. The government has been implementing programs and changes to the basic education curricula. Some non-profit association have been helping to this matter, such as installing computer labs on schools and giving training to teacher for free, with the aim of making this change faster. These strategies in collaboration to the non-profit associations have contributed to an improvement in the education and quality of the life of Mexican society. Nowadays in the globalization era, this issues with education politics in Mexico has been looking for solutions and ideas outside the borders of the country. In Finland the introduced to technology has a different story, technology has been part of the education and society for longer time.

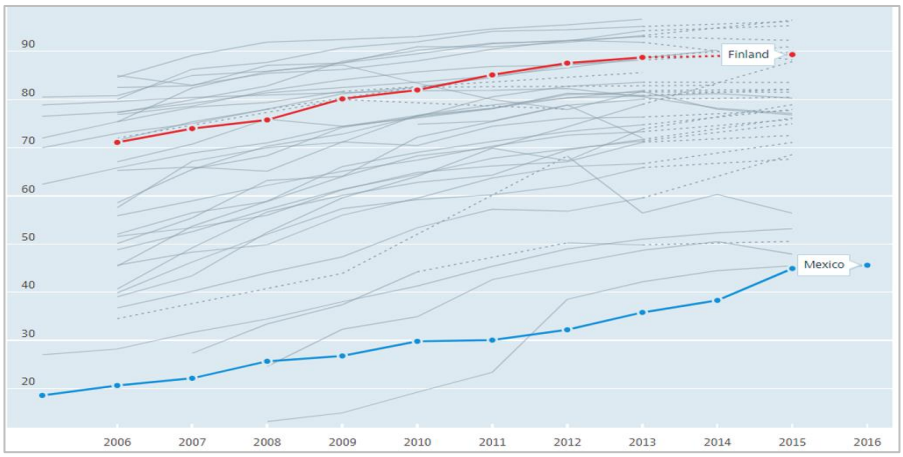
There are two obvious differences between Finland and Mexico, geographically and demographically. Finland has an area of 338,424km^2 and estimated population of 5.5 million people which means a density of 16/km^2. While Mexico the area is 1,972,550km^2 and estimated population of 119.7 million for a 61/km^2 density.

These two important differences affect the way of living, the economy, politics and culture. One big difference is the economy in Mexico, where the GDP is 18,579USD when in Finland is 43,363USD. Many young people in Mexico have to quit their studies to support their families. The government support for students is limited.

In a matter of technology comparisons, according to the OECD data indicators of the access to internet from home in Mexico by the year 2016 is a lot less than what it was in Finland 10 years ago. In 2016 in Mexico the number of households that reported having at least one personal computer in their home is 45.6% while in Finland is 89.3% and 10 years before was already 71.1%. This is one of many factors of having a technological backwardness in Mexican society. By the year 2016 not all students in Mexico have easy

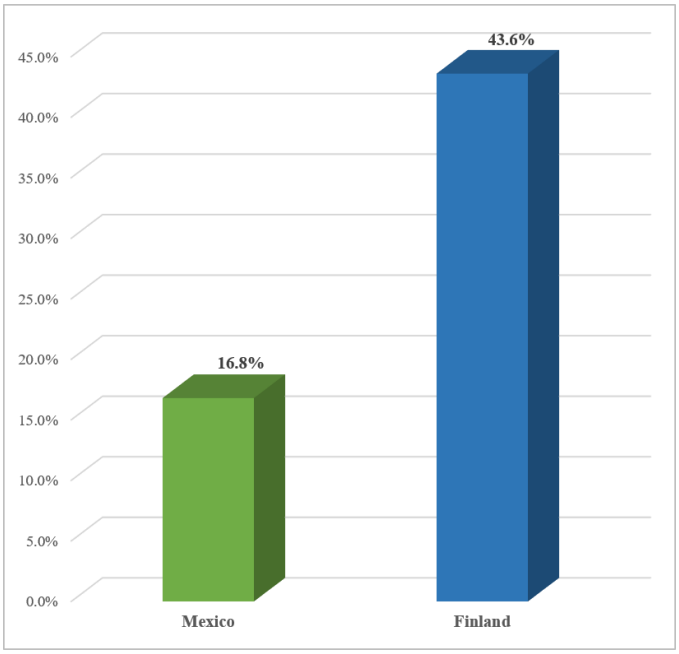
access to a computer for different reasons, for example, not enough equipment on big universities or not the possibility to own a computer at home something that is unlikely to happen in Finland. (OECD, 2016)

Picture 3 shows a comparison between Mexico and Finland about the access to computers from home. This is one of many other reasons and factors to have this technological backwardness which can be seen also in the educational field.



PICTURE 3. Comparison of access to computers from home (Source: OECD data)

Despite of all the socio-economic obstacles that Mexican students can have to complete higher level studies the percentage of graduated students is increasing every year. Still the population with higher education completed is a minority in Mexico (16%). Picture 4 shows the percentages of both countries Mexico and Finland. The measure is percentage of 25-64 years old population.

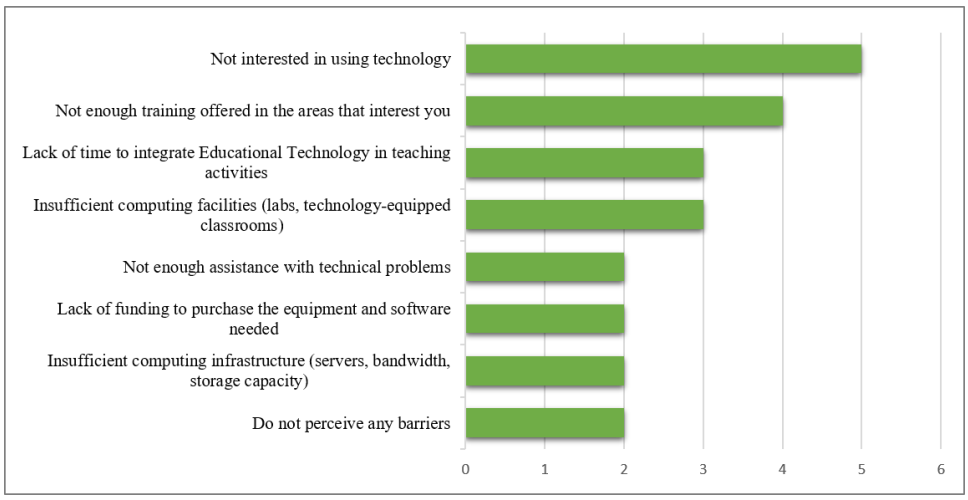


PICTURE 4. Population with highest level of education on 2016 (Source: OECD data)

In Mexico there is a chain of obstacles and problems that make students not be able to continue or not even start a higher education. For those who have the opportunity to attend a higher education the first question is what education can they afford and in many cases they choose their degree program according to their economic situation.

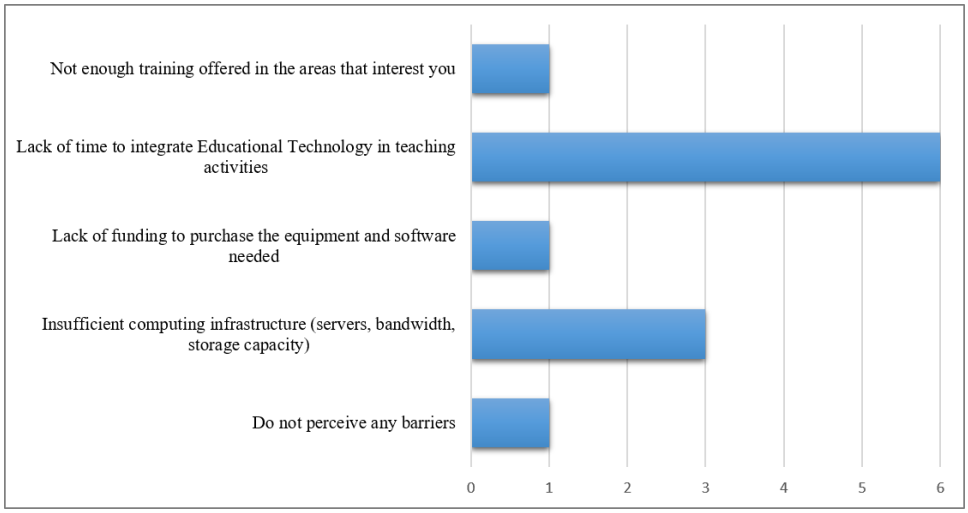
Teaching in Finland and Mexico has cultural differences. While in Finland the methods that teachers follow is by training and the institution rules they change these methods according to the needs and environment development. In Mexico most teachers based their methods in their experience of many years in the field making very difficult for them to accept changes. The best example is the poor inclusion of technology in their courses.

Teachers from both places answered a survey about what they consider are the barriers to use technology in their courses. Picture 5 shows the results from the teachers of higher education in Mexico. According to the survey the biggest problems are the totally uninterested in using technology, not enough training offered to teachers, the lack of time to integrate educational technology in teaching activities and the insufficient computer facilities. The barriers of not enough training to teacher and the uninterested in technology are the ones were these work is based on.



PICTURE 5. Barriers for using technology in Mexico

Picture 6 shows that in Finland the principal barrier for teacher is the lack of time to integrate Educational technology in teaching activities nothing to do with a social, economic or cultural background.



PICTURE 6. Barriers for using technology in Finland

The difference between the universities' teachers in Finland and in Mexico that was not mentioned by Finnish teachers is the disinterest about technology. The teachers consider that is extra work, basically because many of the teachers don't know how to include technology in their courses mostly on those courses they have been teaching for many years without it.

For the barrier of not having enough training offered to teachers, tutorials are a perfect tool for those institutions that don't have the time to trained teachers or the time to coordinate personal training.

Integrating technology will benefit the students to improved attitudes toward learning but also making them more creative problem solvers. The benefits for the teachers can be e.g. improved classroom management, personalized learning, improved students test scores, connection to real world experts and maximized educational resources. In addition, educators can benefit from technology tools to make the teaching work more efficient. Teachers need to choose the proper tools for the class, be trained to use the tools and actively engage all students.

3 LEARNING MANAGEMENT SYSTEMS (LMS)

3.1. Platforms of study

Educational institutions are using different Learning Management Systems to support the teaching methods. A learning management system (LMS) is a software application use to plan, administrate, report, tracking and delivery education courses. This e-learning platform helps to organize and create courses, also to assign them to students and grade them. LMS has been growing as a part of higher education programs. A LMS can be also used for different kind of learning activities and is also a great business tool because a LMS has features such as video conferencing and discussion forums.

LMS offers many benefits for teacher and student. Students have easy access to course material and documentation, anytime and anywhere. LMS gives some independence to teachers to use methods outside the classroom and there is no limited amount of information and resources they can use.

Working with an open source LMS gives a lot of opportunities to learn and teach with collaboration, because there is no limitations to code. Many open source projects have their roots in the academic field and the reason can be obvious. If an open source software is used in the education field it allows anyone to improve the software by inspecting, researching and developing for the benefit of the course or institution.

When choosing the correct Learning Management System it is important to consider your needs and research for the features that each LMS offers. The popularity of the LMS is an important fact to consider when choosing a platform solution, it will be easier to find documentation, articles, forums and online tutorials which can solve your questions. (Paulsen, 2003)

3.1.1 Moodle

Moodle stands for Modular Object-Oriented Dynamic Learning Environment and it is one of the most popular free Learning Management Systems. Moodle has the most users

in Learning Management System market. According to Moodle webpage by 2016 it has more than 100 million users. Moodle is primarily aimed to the academic market but it's also used by many companies for eLearning and training purposes. It's supported by network of certified Moodle Partners to assist with support and active community of developers, users and supporters.

Moodle gives the option to extend the features for a custom learning environment. Many education institutions from higher education can easily integrate Moodle with many existing systems they use like Office365, GSuite from Google Cloud, NextCloud and others.

Unlike many other open source LMS solutions, you can get answers to urgent questions almost immediately by accessing the online support database on Moodle website.
Moodle's basic structure is organized around courses. These are basically pages or areas within Moodle where teachers can present their learning resources and activities to students. (MOODLE, 2017)

3.1.2 Blackboard

Blackboard Inc. is an educational technology company with two major product lines: the Blackboard Commerce Suite and the Blackboard Academic Suite. The company is best known for the Blackboard Learning System, the course management system for classroom and online educational assistance for institutions.

The main disadvantage with Blackboard it's can be expensive. The cost depends on how many licenses are required and the detailed pricing information by quote is not publicly available. Anyhow it is considered to be a great value for the cost.

Blackboard is a certified Moodle partner, the largest Moodle's partner in the world. Moodlerooms is the open source division of Blackboard. Also Blackboard it integrates with other business systems and applications such as Pearson LearningStudio, Sakai Collaborative and Learning Environment and Desire2Learn, Epsilen, BrainHoney and itsLearning. (BLACKBOARD, 2018)

3.1.3 Brightspace

Brightspace is a LMS developed by Desire2Learn is a suite of products that empowers educators and enterprises with the tools to design the best possible experience for their learners. Brightspace was developed as an innovative LMS that can create, host and edit online resources. This learning environment system is focus on institutions and companies and offer them the tools to create customized content. Brightspace it's not free but it offer a free trial. In order to get information about the price it is required to contact a vender directly. The prices can be flexible because those are according to the user needs. (BRIGHTSPACE, 2018)

3.2. Open Source Software

The term of Open Source refers to those software that is available with source code included or has no restrictions to modifications or distribution of the code. Also can be called Open Source Software or Free software.

Advantages of using open source software includes the possibility to view the source code, change and redistribute source code, adopt new platforms, develop and deploy effectively internationally.

An Open Source gives the possibility to reduce software licensing costs, the risk and effort to organizations when they tried to personalize and adopt a software according to their needs. This is the case of Moodle in Education institutions. Some LMS are open source but their code is not totally open to public. (Kavanagh, 2004)

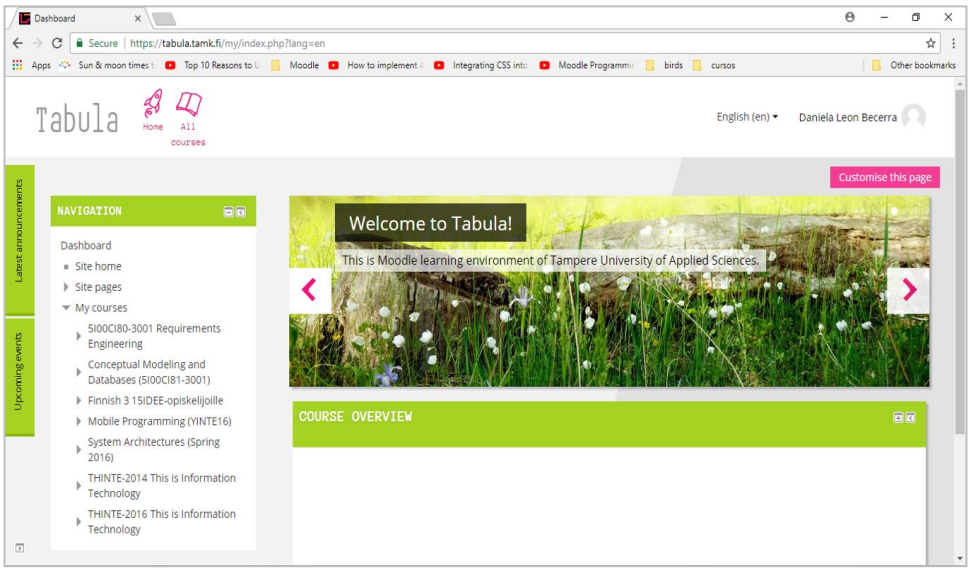
4 UNIVERSITIES USING LEARNING MANAGMENT SYSTEMS

4.1. Tampere Universities

TAMK works with Tabula. Tabula is an online learning environment based on Moodle, which is used as support for teaching in the classroom and as an e-learning tool. Teachers use Tabula in their courses according with their own pedagogical point of view and as much as they decide.

Tabula is a simple web learning environment and is well suited to support the courses program and the sharing of material. Tabula can also be named for example, a virtual learning environment, a course management application and a learning platform. These terms are about similar terms but emphasizes different things in the application's functionality. The term used in TAMK for Tabula is Virtual Learning Environment VLE.

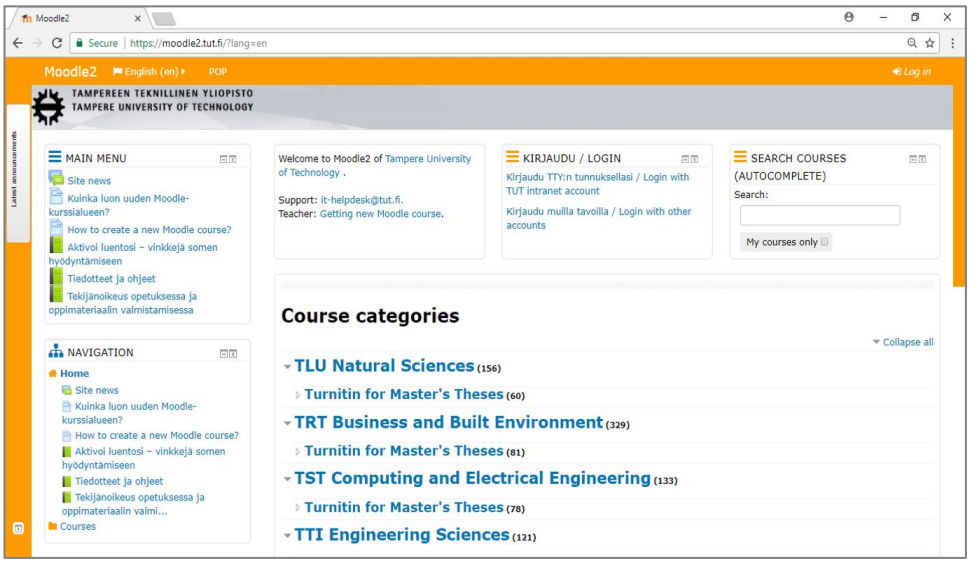
TAMK is involved in the national Moodle User Community (MOODLE-FI), coordinated by the University of Helsinki. (TAMK)



PICTURE 7. Tabula home page. (https://tabula.tamk.fi)

Picture 7 shows Tabula home page after signed in. Tabula is available in Finnish, German and Spanish.

TUT uses Moodle for all communication between teachers and students. Moodle page requires a user and password for each student and each course requires an enrollment key that is sent to the enrolled students before the course begins. The platform is available in Finnish. German, English and Swedish. (TUT)



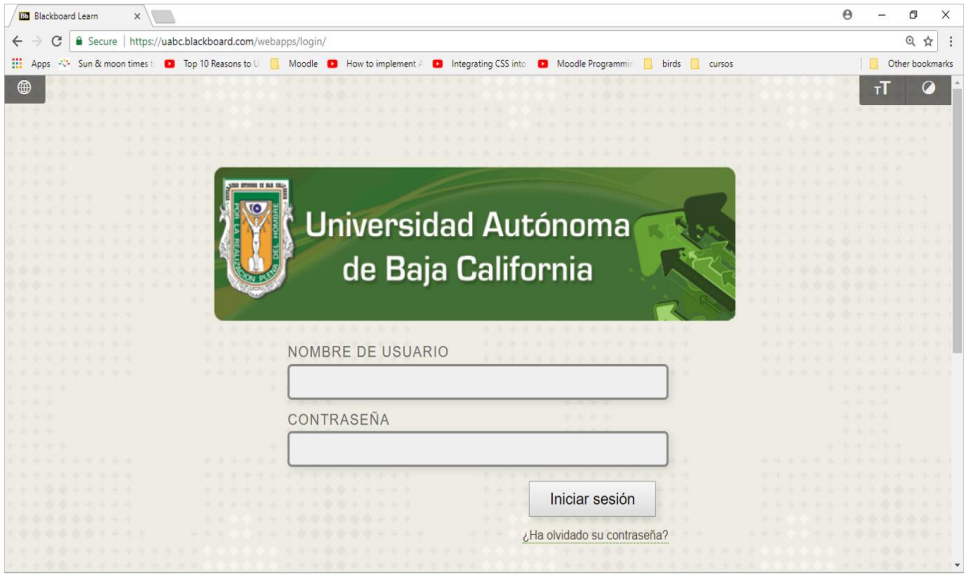
PICTURE 8. Moodle2 of TUT home page. (https://moodle2.tut.fi)

Both universities offer training sessions for new users and continuing modules courses. The schedule is in their own webpage. These courses are for free but a pre-registration is required. The courses aim is that teachers develop their own methods for teaching and learning and to support the students' participation.

4.2. Tijuana Universities

UABC is using Blackboard as their platform for administrating the courses and it is used as a support tool for face-to-face or long distance courses offered by the institution for bachelor's degree, postgraduate and continuing education programs.

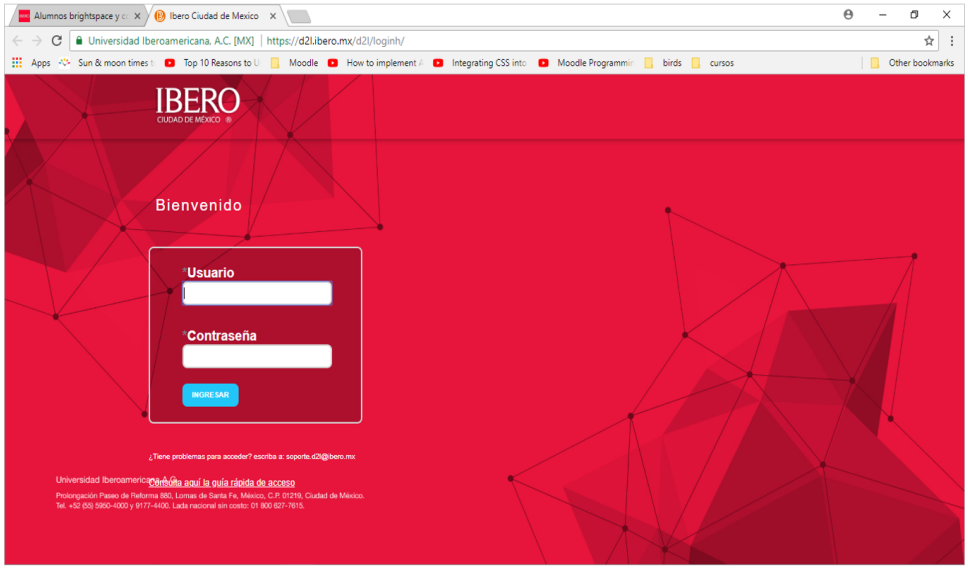
Currently, the platform is used only by those teachers who request the availability of their course through the Coordinator of open education of their academic unit. However, whether they are used regularly or not, it is advisable that teachers and students of the UABC community are familiar with its operation because in case of a contingency it is possible to continue the lessons through work online using Blackboard.



PICTURE 9. Blackboard of UABC home page. (http://alumnos.uabc.mx/web/alumnos)

In UABC is not mandatory for the teacher to use the platform but the university is promoting and supporting to increase the use of it. The academic unit website has tutorials, documents and videos to help teachers and students to solve questions. (UABC)

Universidad Iberoamericana's aim is the academic recognition and always tries to offer an innovated and quality education program that is why recently it changed to Brightspace platform allowing teachers and students access to all the information and services through it. The launched was in January 2017 considering that with Brightspace, the school offers a more modern and engaging experience to their students.

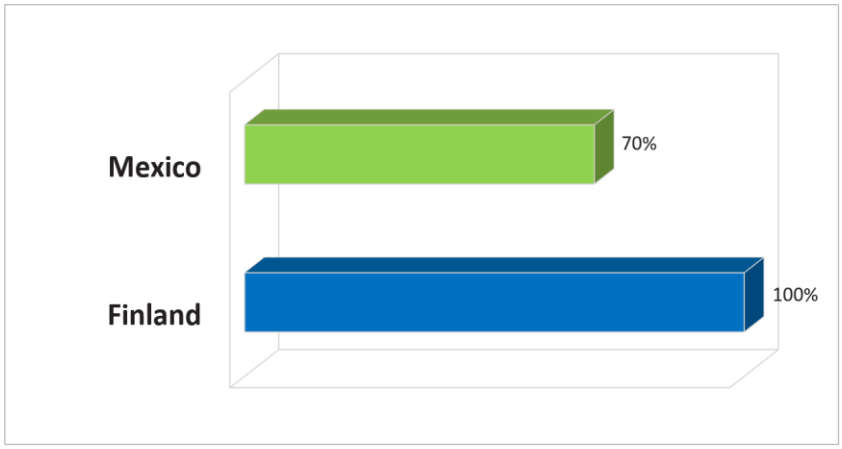


PICTURE 10. Brightspace of Iberoamericana home page. (https://d2l.ibero.mx/d2l/loginh)

Iberoamericana University works with Brightspace and it's the university's department of distance education the one in charge of providing training and support to students and teachers. The department shares tutorials with students to promote courses online as an opportunity to develop skills and the work of independent studying. For the teachers the university offers training courses face-to-face and online courses. (Universidad Iberoamericana, 2018)

4.3. Statistics and results of the use of management systems

Picture 11 shows the percentage of teachers who have used Moodle or any other Learning Management System. According to the survey most of the answers of the teachers in Finland use Moodle as a LMS requested from the university.



PICTURE 11. Use of LMS by teachers

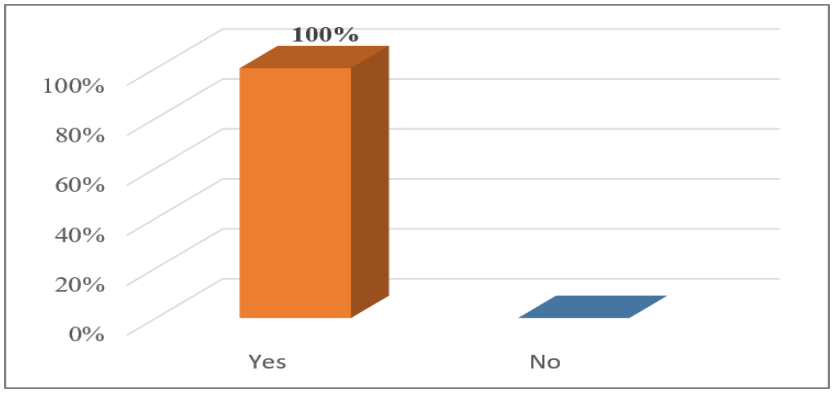
4.4. Teachers training

"Teachers will not be replaced by technology, but teachers who don´t use technology will be replaced by those who do" says Sheryl Nussbaum-Beach, co-founder and Chief Executive Officer of Powerful Learning Practice. (Integrating New Technology in the Classroom)

Understanding that teachers have to become involved in this technology era I defined three rules to be considered when working with educational technology.

1. Use technology as a teaching tool
2. Use technology as a learning tool
3. Use technology as a tutor

According to the survey, all the teachers questioned in this study agreed had received trained by the university they work, picture 12. This training can be face-to-face or online the universities also provide support. The teacher can also contact the LMS online support individually.



PICTURE 12. Teachers trained by their university

There is no measure to know if all the teacher have the same skills on using the LMS in the university and none of the universities mentioned in this study demands specific time or amount of work in the platform by the teachers.

5 INSTALLING AND CONFIGURATING MOODLE

5.1. Requirements

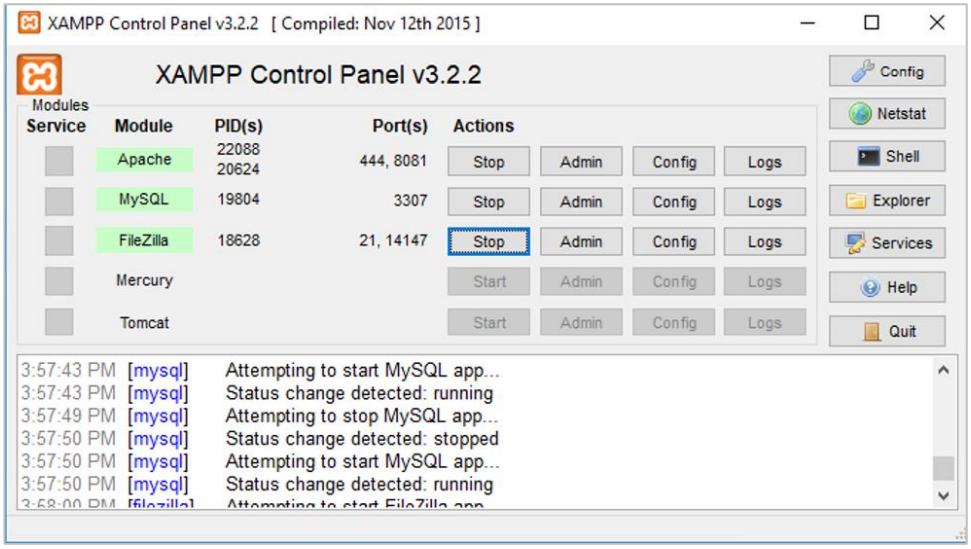
A Moodle installation occupies about 200MB for the Moodle code up to around 5GB to store content. A processor of 1GHz as a minimum or 2GHz dual core or more is recommended. Moodle is compatible with any standards compliant web browser.

Moodle is run from a web server, it is required a database and needs PHP configured for software requirements. The minimum version for MySQL is 5.5.31 and for PHP 7.0.0, this last one requirement has increase the minimum version since Moodle 3.3.
(Moodle Development, 2018)

5.2. Installing Moodle using a localhost

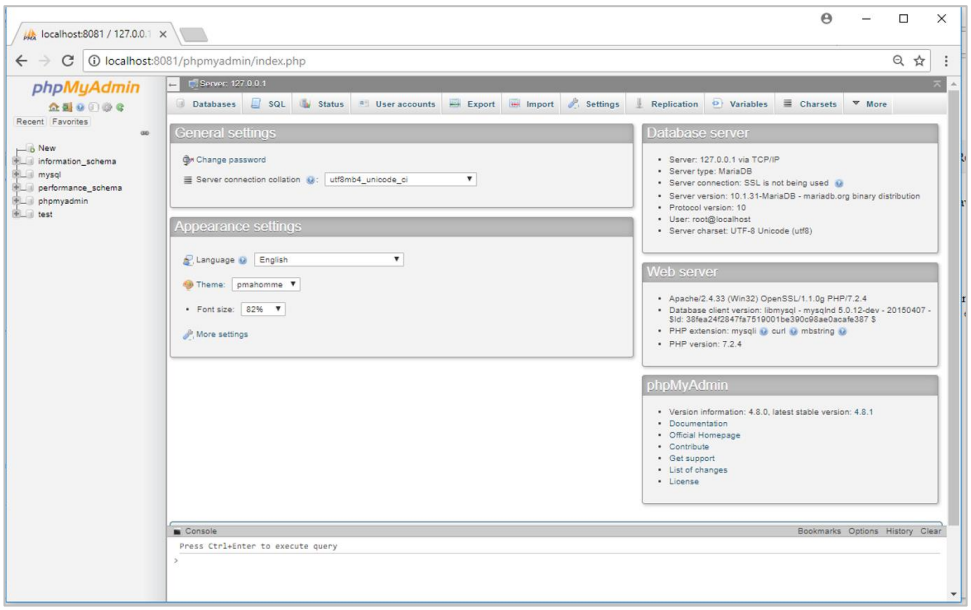
It is necessary to install Moodle as an administrator to be able to change, configure, install plugins, etc. and to be able to work with Moodle the first step is to get ready by installing few other software. All the download for this work were from the software´s websites for free.

There are few options for a web server but for this work the Apache web server 7.2.4 was installed on the local disk. Apache web server and MySQL software were installed using the open-source tool XAMPP. PHP is the scripting language in which Moodle is developed and it is integrated with the web server. The PHP version installed is 7.2.4. For the PHP extensions Moodle checks, by itself, during the installation process if there is something missing or if there is a problem to be fixed. Picture 13 shows the control panel of XAMPP. Apache and MySQL can be start or stop when it´s needed. (Apache)



PICTURE 13. XAMPP control panel for MySQL and FileZilla

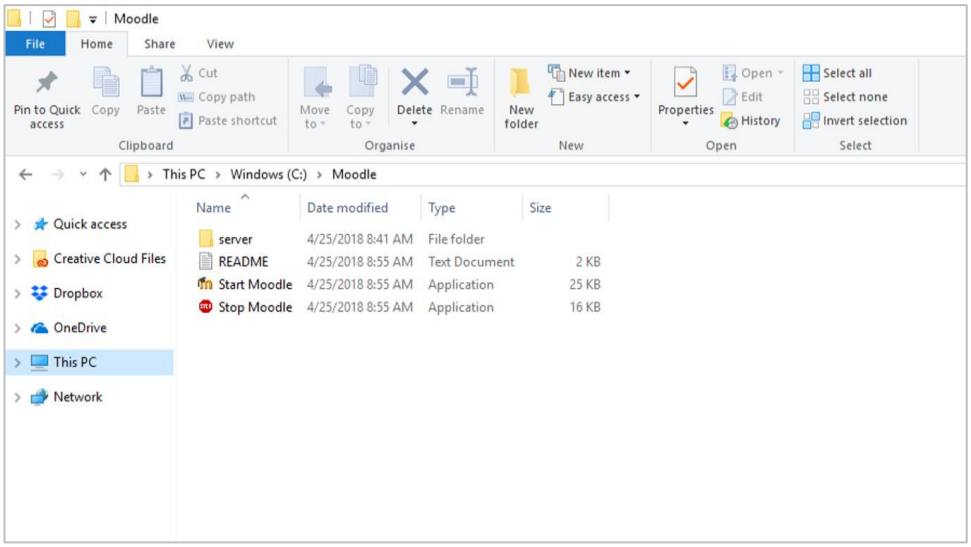
For the database phpMyAdmin is installed and it requires a username and password to sign in. Picture 14 shows the home page of phpMyAdmin the software that will administrate MySQL over the web.



PICTURE 14. phpMyAdmin home page

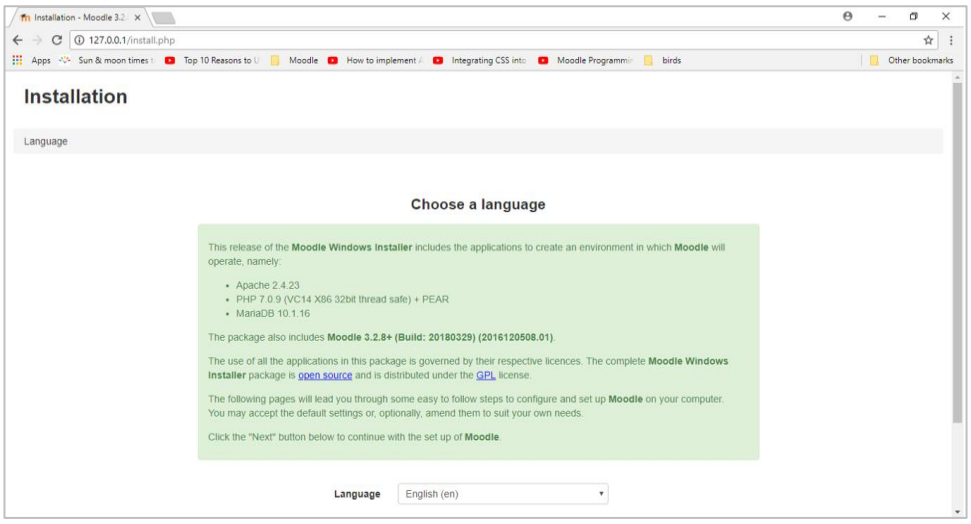
For Moodle installation the website provides the installer package of the last version release from Moodle. The version installed for this work is Moodle 3.2.8 for Windows downloaded from the official website as a single compressed file that contains the files and directories that constitute Moodle.

After decompressed the ZIP file on the local hard drive the installation of Moodle continue by accessing the Start Moodle Application form the file window as it´s shown on picture 15.



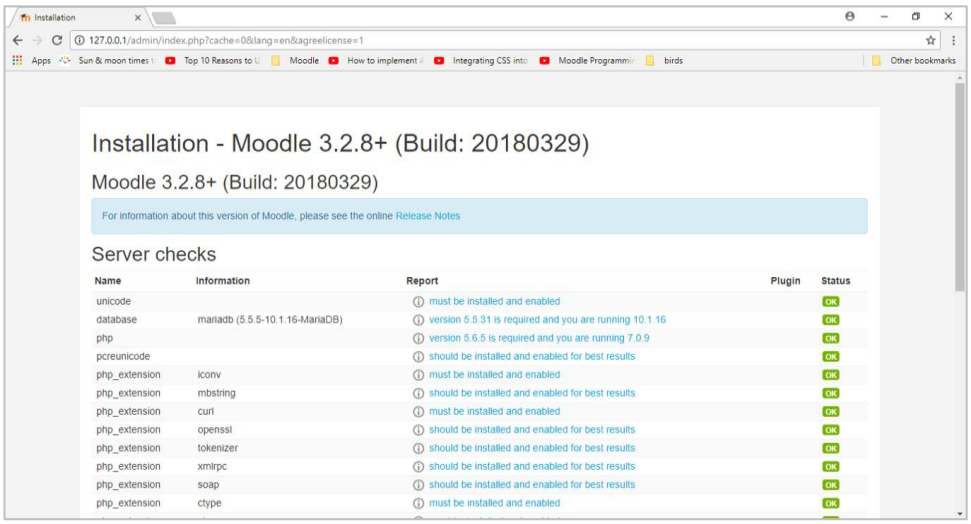
PICTURE 15. Decompressed file on the local hard drive

Moodle can start only after the web server is install and running. When Moodle started correctly the installation continue by accessing from the browser to localhost with the URL 127.0.0.1 and the Moodle installation process page opens as on Picture 16. Then it´s just about following the instructions.



PICTURE 16. Moodle installation

During the installation process a Moodle directory is created as *C:\Moodle\server\moodle* and also a Data directory as *C:\Moodle\server\moodledata*. While the Moodle installation continues it runs tests for all the systems required as on picture 17 shows the status is OK for all the server checks.



PICTURE 17. Server checks during Moodle installation

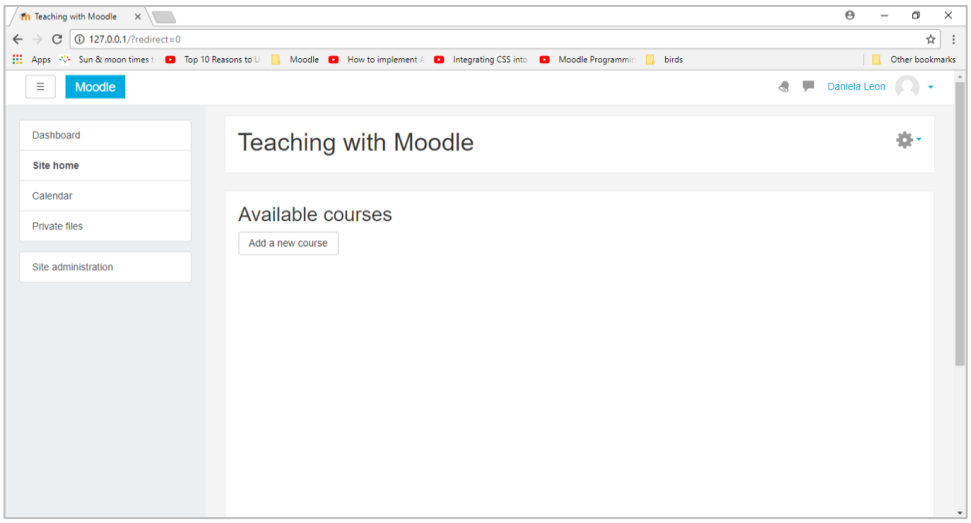
At the end of the installation is the Setup administrator account, it means the page to configure the main administrator account which will have complete control of the site. It requires a username, password and a valid email address. It is possible to create more administrator accounts later. (Moodle Development, 2018)

A Moodle site can be also ready to work with MoodleCloud which is the latest version hosted by Moodle in the cloud. This is an option if there is no wish of downloading and installing the software the work can be done in MoodleCloud. This hosting solution prevent plugins to be install from within Moodle. For that reason in the purpose of this study it is not possible to use MoodleCloud. (MoodleCloud)

5.3. Using Moodle

Picture 18 shows the Site home page on Moodle. This site can be edit as much as the administrator wants by changing the appearance. The page can be personalized as well as each course added to this site. To personalized features and functions can be done with plugins as chapter 6 will explain.

Moodle site access is from the browser. The URL location will be *127.0.0.1* and it will open the Moodle installation. The username and password is required.



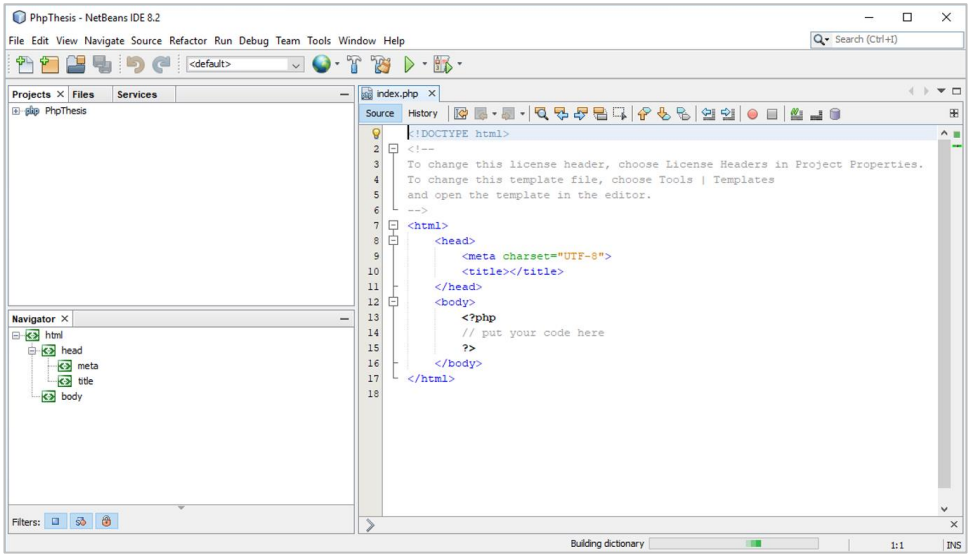
PICTURE 18. Moodle Site home

According to Moodle the Site home is a customizable dashboard page that provides the user the main menu with the main links to the courses and assignments like calendar, unread messages, upcoming events, etc.

5.4. Installing NetBeans

NetBeans is an Integrated Development Environment (IDE) for Java. NetBeans IDE is a free project that helps users to develop applications and provides support for several languages and frameworks. NetBeans IDE 8.2 version was installed for this work, downloaded from the website. Picture 19. (NETBEANS)

Moodle also suggests other software that developers can use such as phpStorm or XDEBUG.



PICTURE 19. NetBeans IDE 8.2 installed

6 NEW TUTORIAL

6.1. Installing Plugins

Plugins enable the administrator to add additional features and functionality to Moodle, such as new themes appearances, new activities, new quiz question types, new reports, integrations with other systems and many more. Moodle has a list of plugins for specific needs that can be found in the official web site. Also it's possible to add a new plugin code into Moodle site.

There are three ways that the plugin code can be install into Moodle: Installing directly from the Moodle plugins directory on the web site, installing by uploading a ZIP file or installing manually at a server.

The web server has to have written access to the plugin type folder where the new plugin is to be installed in order to use either of these methods. They will be found by Moodle automatically. Moodle site has a list of plugins also classify subjects, disciplines or level of education, such as plugins for Universities. Also many Universities have created and share these plugins in to Moodle database. (Moodle Development, 2018)

6.2. Creating a new theme

This work will be focus on a new theme where the new features will be configured. Then, to create a new theme or to customize an existing one, directories and files need to be created. The directory should be the same name than the new theme and it's located within the theme directory of Moodle as is shown in picture 20.

PICTURE 20. Files and folders in the new theme directory

There are some files that are needed for a new theme installation. Those files can be created or edit the configuration from an existing theme. A theme can extend any number of themes. It is a better option to extend an existing theme by editing and modifying than creating an entirely new theme. It will be easier to use the basic layout and enough CSS to make work the new theme.

An important aspect to consider is that to customize an existing theme license has to be reviewed to know if it is allowed to do all kind of modifications. (Moodle Development)

The following list is for the most important and useful files required to customize an existing theme.

config.php

This file is for the settings and it's necessary to change the original theme name to the new theme name, in this case "tutorialmode" as in the next part of the code. If there are other config.php files open, the name of the theme will help to identify which one Moodle is looking at.

```
$THEME->name = 'tutorialmode';
$THEME->parents = array('tutorialmode','clean', 'bootstrapbase');
$THEME->doctype = 'html5';
$THEME->sheets = array('tutorialmode','custom');
$THEME->lessfile = 'moodle';
```

/style/

This directory will contain all of the stylesheets. The CSS files from the original theme that the user wants to keep and the new ones.

/pix/

This directory will contain a screen shot of the theme as well as any images are use in CSS.

/layout/standard.php

The layout directory will contain all the layout files. The file standard.php will be one basic layout file.

/lang/en/

The file we put here will make our theme name show properly on the Theme Selector page. You need a few standard entries. Copy the one from the Standard theme and modify is easiest.

6.3. CSS Tooltip

In this work the customized theme will use *Tooltips* an element that will help to improve the use of Moodle for beginners or inexperienced users.

A tooltip is an element that appears when the user moves the mouse over it and is often used to specify extra information. A tooltip can appear in as many elements are needed to be placed. The tooltip can be customized the font color, background, rounded corners, size, position etc. (W3Schools, 2018)

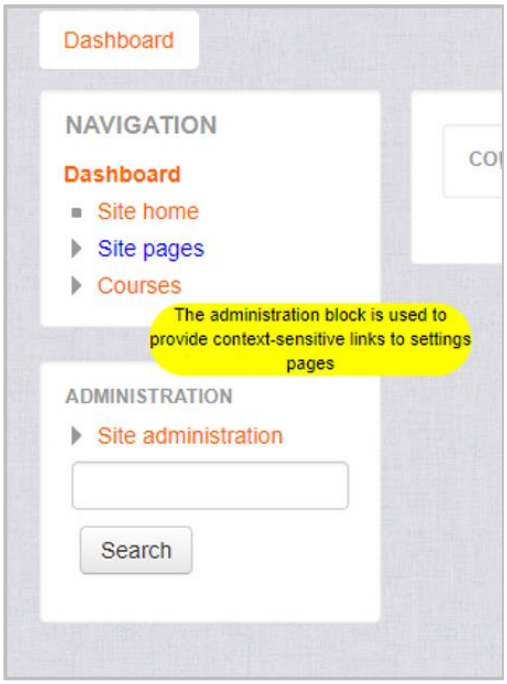
The following code is for the tooltip properties created with CSS on this example.

```
.tooltip {
   position: relative;
}
.tooltip .tooltiptext {
   width: 200px;
   background-color: #FF0;
   color: #000;
   text-align: center;
   border-radius: 60px;
   position: absolute;
   bottom: 100%;
   left: 50%;
   opacity: 0;
}
.tooltip:hover .tooltiptext {
   visibility: visible;
   opacity: 1;
}
```

The fragment above is for the properties that the tooltip will have every time that it's called for different elements, yellow background, black font and rounded corners.

Coding can be as detailed as is required. The following code is an example that will be for each element when the mouse pointer is over it. Picture 21 shows the example for the "Administration" element.

```
<div id="instance-17-header" class="tooltip" ><h2>Administration</h2>
   <span class="tooltiptext">The administration block is used to
   provide context-sensitive links to settings pages </span>
</div>
```

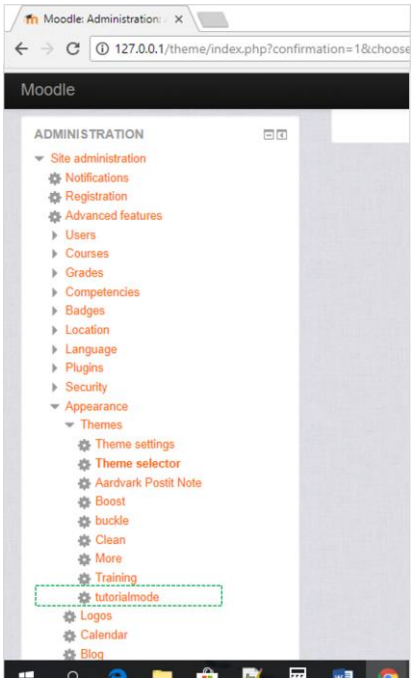


PICTURE 21. Example of one element description on Moodle site.

6.4. Moodle Tutorial Mode

The Tutorial Mode will work as a new theme, it can be use as long as every user wanted. When the new files are saved in the theme folder in the server Moodle will detect it and include it as another theme. If the installation it's correct the new theme will appear on the themes list in the site administration menu as it´s shown in picture 22.

The new theme can be selected as simple as changing the theme for the time is required and then go back to the default or desired theme as many time as the user wants.



PICTURE 22. Themes menu on Moodle administration site

The new themes appear in this menu only if the installations are successful.

7 CONCLUSIONS

This work is recommended as an additional help for the education institutions that use LMS especially for those institutions that are implementing for the first time or will like to implement a Learning Management System in Mexico. For the education instructors the use of technology is a reality, they can choose within multiple options the best one for a specific need and improve it.

Additional actions can be taken to make the tutorial with more details as much as the institution consider the teachers need explanation. In a way this work showed only the first steps that can be taken for a tutorial installation, knowing that it can be developed as much as it is wanted, required or necessary. Also has to be considered that it is a tool that can be use temporal or permanently depending how quickly is to the user to get better skills.

I believe this tutorial can be applied on different LMS for institutions of different educational levels. Private institutions in Mexico are more open to try new options as long as those don't affect the studies program. Universidad Iberoamericana is willing to try new tools all the time and the IT department is open to work with a trial program.

This work was a personal knowledge experience and all the troubles, mistakes and difficulties from the way to develop a topic through the struggle on fixing problems behind the installation, each step was a significant challenge.

Beside the technical struggles there is still my concern about the poor level of education in Mexico hoping that the day when I can apply this research tool to the educational field I can help one or many instructors in their teaching work.

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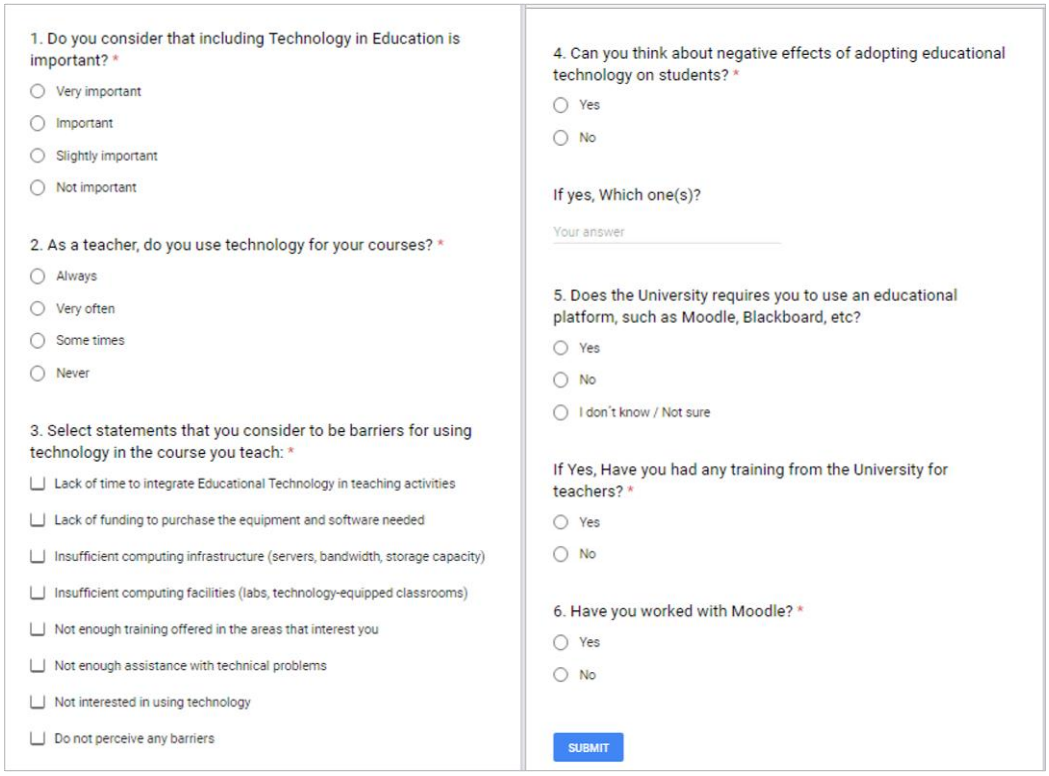
APPENDICES

Appendix 1. Survey



1. Do you consider that including Technology in Education is important? *
- Very important
- Important
- Slightly important
- Not important

2. As a teacher, do you use technology for your courses? *
- Always
- Very often
- Some times
- Never

3. Select statements that you consider to be barriers for using technology in the course you teach: *
- Lack of time to integrate Educational Technology in teaching activities
- Lack of funding to purchase the equipment and software needed
- Insufficient computing infrastructure (servers, bandwidth, storage capacity)
- Insufficient computing facilities (labs, technology-equipped classrooms)
- Not enough training offered in the areas that interest you
- Not enough assistance with technical problems
- Not interested in using technology
- Do not perceive any barriers

4. Can you think about negative effects of adopting educational technology on students? *
- Yes
- No

If yes, Which one(s)?

Your answer

5. Does the University requires you to use an educational platform, such as Moodle, Blackboard, etc?
- Yes
- No
- I don't know / Not sure

If Yes, Have you had any training from the University for teachers? *
- Yes
- No

6. Have you worked with Moodle? *
- Yes
- No

SUBMIT