Preference of the Use of Moodle as a Learning Management Systems in Brazilian Universities

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Abstract—In this paper aims to discuss the reasons that lead Brazilian universities to prefer Moodle as a Learning Management Systems. The study was based on the studies of [1]-[4] and the results were sought in a survey carried out in 60 (sixty) of the main universities of the country raising the environments used for them. The research is of an exploratory nature. The study reveals that the Moodle Learning Machine Systems has had the preference of the great majority of Brazilian Universities as a tool both to promote the interactive process between students and teachers and between the students themselves in distance courses, as well as in support of face-to-face teaching. The study also revealed the existence of two new environments, the Canvas and the Virtual Class, which emerge as new alternatives as tools to propel the interactive process both for those involved in distance courses and as support for face-to-face teaching.

Index Terms—learning management systems, distance education, information and communication technologies

I. INTRODUCTION

Inthe current social context, in which information and communication technologies become increasingly present in people's lives, and the ever-increasing need for training to be either initial or continuous, it is emerging that the figure of Learning Management Systems - LMSs. These environments used mainly by universities constitute an important tool in the interactive process between students and teachers in Distance Education – EAD courses and that in recent times has also been widely used as a support for face-to-face teaching. This study had as main objective to analyze the reasons that lead the main Brazilian Universities to prefer Moodle as a virtual learning environment.

The research is characterized as a bibliography of an exploratory nature and was carried out based on a survey of the Learning Management Systems used by the 60 (sixty) major universities in the country. The criteria for choosing these as the main ones were the number of students. Some such as Paulista University - UNIP,

Est ácio de S á and Salgado of Oliveira are among the six largest in terms of number of students. Others such as the University of S ão Paulo - USP, the University of Campinas - UNICAMP, the Federal University of Rio Grande do Sul - UFRGS, Federal University of Rio de Janeiro - UFRJ, the University of the State of S ão Paulo - UNESP recognized with a good standard of excellence. Also included in the research group were federal universities in the states due to their importance in their regions, in some cases being the only option of public university in the state.

Finally, another group was the federation with regional influences within its states, such as the Federal University of Santa Maria - UFSM, in Rio Grande do Sul, the Federal University of the Mining Triangle - UFTM, the Federal University of Lavras - UFLavras and many others that are major university centers with regional influences.

II. THEORETICAL FOUNDATION

The contemporary society marked by the acceleration of the transformations and the demands as to the necessity of formation, makes that the man and the woman of the contemporaneity are constantly worried about its formation, be it initial acquiring a professionalization, or even the improvement.

In [5] referring to this need for training states: "Continuing education understood as the increasing search for the improvement of people from the earliest age to the last days, is present today in all sectors (... "And according to [6]" Continuous training in the work space itself is more efficient because it is within the reach of the participants, because it is where everyone lives with their group. "

It is in this context of concern of the human being with the formation that the interest of the modality of distance teaching appears.

The current development of the EAD coincides with that of the information society and the ever-increasing needs of the labor market for skilled labor, requiring citizens always a greater and better training, which has caused individuals to leave in a race by training courses, mainly at the level of higher education (graduate and postgraduate) [7].

And it is in this race for training and making an option for Distance Education that also enters the relevance of ICT Communication and Information Technologies. Still according to [6] "(...) today, one cannot speak of qualification without appropriation of the technologies".

In order to respond to this clamor of postmodern society for the need for training, Information and Communication Technologies - ICT have made their contribution in facilitating the communication process between those involved in distance learning courses. Historically one of the bottlenecks of this modality was the isolation of the student and in consequence the demotivation and the avoidance. The communicational possibilities undertaken by the new technologies facilitated the interactive process among those involved, thus contributing to a new dynamics of the modality.

Among the various technological possibilities that have fostered the practice of distance education, we highlight here the LMS. According to [7] LMSs are Internet-based environments, which are intended for the electronic management of courses and virtual learning activities, which are employed both in the provision of Distance Education and in support of face-to-face activities.

Already [1] state that:

LMSs are software used to manage the teaching and learning process that allow the administration of the common features of the communication software, computer mediated and methods used in courses offered online.

The fact is that these environments have been playing an important role in the dynamization of Distance Education, mainly through the provision of material for people studying in this modality as well as in the promotion of the interactive process between students and teachers through the tools of synchronous or asynchronous communication.

Given this social context, the distance education modality becomes the tool in conditions to make it possible to meet this need by training in the most distant regions of the large urban centers, where the universities are usually located, as well as enabling people who enter the labor market without the proper training can also apply for training in various areas.

Virtual learning environments, an essential tool to make EAD feasible these days, have also been used in face-to-face courses in new educational models such as the inverted classroom, hybrid teaching, mobile learning, etc. In this way, the Distance Modality has contributed not only to favoring access, but also to the dynamization of the educational process as a whole, since the resources that were originally created for this modality are also collaborating as the face-to-face education model. "On the other hand, courses that have face-to-face education as a modality also benefit from these experiences, with the adoption of new practices." [3]

In [3] highlights the emergence of a convergence phenomenon between virtual and face-to-face not only through the application of content management resources in learning processes in Distance Education, but also the use of ICTs, with the perspective of adding value to face-to-face education processes.

LMSs initially served primarily as a material delivery tool for people who ventured into distance learning. But according to [8] today, the environments are more similar to communities than the content repository. They are places where questions can be formulated and answered, information can be collected and offered, and real people can interact and learn cooperatively and collaboratively.

Virtual learning environments fall into two broad groups. The group of free software and proprietary software. The main difference between the two groups is the availability or not of their source code for reproduction and other adaptations.

The LMS proprietors have distribution based on the commercialization of their use or sale as product to be implanted in the company / contracting institution. Normally its source code is closed, that is, it does not allow reprogramming of its tools or adaptations in the operation of its resources. Already Virtual learning environments based on free software precepts can be used or installed free and can be modified / adapted by programmers [5].

Among the universities surveyed, the vast majority have a preference free or open source software. The option for this model is believed to be both for not requiring payment and for the possibility of adapting the tool to the real needs of the institution.

"Among the LMSs most used today are the Blackboard Learning System, the IBM Lotus Learning Space (commercial), the Moodle (free code), and the national Teleduc (UNICAMP) and AulaNet (PUC-Rio) [8]. In this way it can be said that in Brazil Moodle has the preference of the great majority of higher education institutions.

III. ENVIRONMENT FOUND IN RESEARCHED UNIVERSITIES

A. Amadeus

The Amadeus was created by the research group CCTE1 of the Center of Informatics of the Federal University of Pernambuco - UFPE and means Agents Microworld's and Analysis of the Development of the Use of Instruments. The system is distributed under a free software license, allowing it to be freely studied, copied, executed, evolved and shared.

It defines itself as a "Learning Management System (LMS).

For it offers the possibility of "new styles of interaction". Interaction "of the user with the system, with the content and between the other users [9].

The environment presents the possibility of integration between various media such as videos; textual content; audio and images. It still has as one of its key features its potential for collaborative environment.

B. AulaNet

AulaNet is a Web-based cooperative learning environment developed at the Software Engineering Laboratory (LES) of the Department of Informatics of the Pontifical Catholic University of Rio de Janeiro (PUC / RJ) for administration, creation, maintenance and assistance of courses a distance [10].

The environment has objectives: to promote the adoption of the Web as an educational environment; contribute to pedagogical changes, supporting recreation; and averaging the knowledge of knowledge, both to children about to teachers.

With this in mind, we have designed AulaNet, which is an environment for the creation, participation and administration of web-based courses, whose development has been carried out since June 1997 at the Software Engineering Laboratory of the Informatics Department of PUC-Rio. Having always in mind the need to learn to work in a group, our approach is based on the cooperative working relationship that manifests in the interactions of the learner with his instructor, with his fellow learners and with the didactic contents [11].

AulaNet offers a set of communication, coordination and cooperation mechanisms in order for the teacher to elaborate his / her course according to the objectives of the learning process. These mechanisms include electronic mail tools and mailing lists, asynchronous textual newsgroups, synchronous textual conference tools (chat) and videoconferencing tools (CU-SeeMe) [12].

AulaNet is characterized by simplicity and ease of operation, since: the course's author does not need to be a web expert, the courses created must have a high degree of interactivity, in order to attract more student participation in the learning process.

C. Canvas

Canvas is an LMS was created in 2011 by the company Instructure that currently has more than 1100 employees including a team in the city of São Paulo that supports all of Latin America.

The environment differs from the rest, mainly because of its innovative cloud-based differentiator and open source software, allowing many applications, solutions and educational programs created by other companies to be easily integrated during course development. "In addition, because it is cloud-based, its features are updated automatically and the same version is made available for all users to access from anywhere and on the device.

One of the differentials of Canvas is that it is much more intuitive than its competitors, which facilitates its use, creation and sharing of content. By being open, it enables customization of the layout and interaction between learning tools. It is also one of the safest systems on the market with the shortest downtime. By having its source in the cloud the system does not have the need to be hosted on a local server.

D. Eureka

Eureka is a virtual learning environment created in the year 1999, by the Interactive Media Laboratory of the Pontifical University of Paraná - PUC-PR. In order to promote the approach of people without the need for displacements, to share ideas, proposals, doubts and questions, is what makes this environment an important resource in the search of the collective construction of knowledge [13].

The environment integrates several functions in the same environment such as activity control agenda, discussion forum, chat (chat), files, e-mail, notice announcements, access and note reports, web pages, (learning objects), among other synchronous and asynchronous tools [6].

E. Moodle

Moodle - (Modular Object - Oriented Dinamic Learning Environment) Modular Object-Oriented Dynamic Learning Environment was developed in the 1990s by Martin Dougiamas in his doctoral research at Curtin University of Technology in Perth, Australia, and his release in version 1.0 in 2002 and had continuity with a community of collaborators, since the system is open source software which means it can be installed, used and modified. It aims to manage learning and collaborative work in a virtual environment, allowing creation and administration of online courses and work groups. [4], and in this case, community of developers, large amount of documentation, availability, scalability, fully online facility, semi face courses and assists in the pedagogical management of face-to-face courses.

According to [14].

Moodle is an extremely robust platform with one of the largest user bases in the world distributed in 155 countries, with more than 25 thousand installations, and more than 4 million students distributed in more than 360 thousand courses.

In Brazil, Moodle has been used in a very expressive way, especially by the higher education sector, for example the Federal University of Mato Grosso - UFMT, University of São Paulo - USP, Federal University of Santa Maria - UFSM, Catholic University of Brasília - UCB, among others [3].

The environment presents a modular structure with a large developer community, a large amount of documentation, availability, scalability, ease of use, interoperability, stability and security. This platform has acceptance for its ease of handling and for being an open source and free software based on the internet [4]. Although new software is emerging in the market, Moodle is an important reference when speaking in a virtual learning environment.

F. Navi

The NAVI Platform is the technological solution for Distance Education (EAD) developed by the Virtual Learning Center (NAVi) of the Administration School (EA) of the Federal University of Rio Grande do Sul - UFRGS. It is characterized as an Interactive Learning Environment on the web, encompassing resources such as video chat rooms and online meetings, forum, torpedo, message board, integrated mail, content and news publishing, course agenda, quiz system and various others.

The platform was developed with the purpose of supporting the learning process in the UFRGS, in the areas of teaching (at undergraduate levels, in face and distance modalities), RESEARCH and EXTENSION. Its objective is to seek conditions for the consolidation of distance education (EAD) and offer web-based media and support for complementing and enriching classroom activities, in face-to-face or distance learning modalities.

G. Net Classroom

Like most major Brazilian universities, the Lutheran University of Brazil also preferred to create its own teaching platform to develop the interactive process between teachers and students. The Net Aula is a virtual learning environment used by those involved in the subjects offered at a distance by ULBRA was created based on its own teaching methodologies. Currently it is in version 3.0 [15].

H. Rooda

ROODA - Cooperative Learning Network 2, was developed in the year 2000 and is structured in the philosophy of free software. It provides synchronous and asynchronous web tools for interaction / communication between the subjects, being user-centered, valuing the cooperation process. Since then, it has undergone changes, in order to add new features and improve its performance. From 2003, this environment was recognized institutionally and became part of the Distance Education project of the Federal University of Rio Grande do Sul, as one of the official learning platforms, known as ROODA / UFRGS [16].

The environment was created with the purpose of meeting the demands of the faculty and students of UFRGS. Each teacher can select the tools that best fit his or her work methodology. And it aims to change the educational paradigm from the interaction and cooperation of users in virtual learning environments, being therefore user-centered and valuing the cooperation process [16].

I. PVANET

The virtual learning environment PVANet, developed at the Federal University of Viçosa, aims to promote the cooperative and collaborative teaching and learning process mediated by computer and to aid the teaching-learning process in undergraduate and postgraduate courses in face-to-face and distance learning modalities [17].

The PVANet, besides having suitable interactive tools is easy to use. Due to the way it was designed, it guarantees the teacher a high level of flexibility, which can include, exclude and even define the title of the tools and the level of permission of the users [18].

J. SOLAR

The SOLAR (Online Learning System) was developed by the UFC Virtual Institute - Federal University of Ceará It was created with the proposal to enhance learning by offering its users fast access to pages and content, easy navigation and compatibility with both old and modern browsers. Its pedagogical philosophy is to foster interaction among its participants [19].

The system is based on a three-tier model, oriented to the teacher and the student, allowing the publication of courses and interaction with them. It was developed to enhance learning from the relationship with the graphical interface of the environment, being developed so that the user has quick access to pages and content, and easy navigability [20].

K. TelEduc

Environment created in 1997 by the State University of Campinas - UNICAMP. It is free software, that is, can be copied, modified and redistributed according to the terms of the GNU General Public License version 2, and has several groupware tools, among them, discussion forum, chat room, mural, portfolio and electronic mail [21].

Although TelEduc was developed for the purpose of training teachers in the area of educational computing, it is much more comprehensive, since it has become one of the most widely used software to support distance education in many different areas.

The main users of TelEduc are public and private universities, which use for educational activities, providing materials, supporting communication and interaction among participants. Many companies also find in TelEduc an important tool to train and qualify their employees, because despite the educational approach it has an excellent option for the dissemination of knowledge [12].

The environment provides teachers and students with communication tools (e-mail, discussion forums, chat, etc.), for content availability, for evaluation and for the management of the course and its participants, and is organized by categories of users.

Administrator - responsible for managing the environment and authorizing the creation of courses. Coordinator - responsible for course management. Trainer - responsible for course activities. Student - user who completes the course. Guest and Visitor - users who access the environment, but do not carry out activities [21].

The environment has a good flexibility to adapt the needs of users and stands out for the ease in its use, even for those who are not so familiar with computing. With this type of development, Teleduc adds characteristics that differentiate it from the other environments available in the e-learning market, in which lay people in computing have ease of use; it is flexible in how to use its set of features and characteristics that we will [14].

In view of the foregoing, it can be concluded that TelEduc is an environment of easy use and with a certain ease of adaptation to the user's needs.

L. Tidia-AE

The Information Technology in Advanced Internet Development (TIDIA) program, funded by FAPESP (Foundation for Research Support of the State of São Paulo), with the purpose of financing and encouraging scientific and technological research in cooperative projects related to computer networks high speed. In this project, the LCMS Ae (electronic learning) was developed based on the Sakai framework and offers a collaborative environment and tools to support and support teaching and learning both face-to-face and distance learning [2]

The Ae project was developed with a focus on distance learning and new interconnection technologies, enabling courses to be delivered to a wider audience. It has a traditional access interface, based on web pages. However, new environments and interfaces are being created and attracting the interest of a growing public. [2]

The tools developed in the environment include the three groups of general EAD tools: administration, coordination and communication. In Ae, each user has an individual site, called My Site, which is a space where personal documents can be maintained; include events in a schedule, store resources, and change the Profile information visible to other participants in the environment. The Repository tool is used to store materials such as Word text files, HTML files, images in any format (JPG, GIF) and site links, which can be referenced in other tools in the environment [22].

In this way, *Télia-AE* has become an environment that facilitates interactivity in the learning teaching process and has contributed mainly to higher education institutions that have been using the system as an environment to foster interaction in both distance education courses and of face-to-face teaching.

M. Virtual Classroom

The Federal University of Rio Grande do Norte - UFRN created a management system that manages several sectors of the university as administrative, HR, as well as the academic activities of the institution. The SIGAA (Integrated System of Management of Academic Activities) within this system is the virtual environment the Virtual Classroom. "Has as its main objective to increase the interaction between students and teachers in the teaching-learning process [18].

The system despite the short time of existence is well accepted in the educational market, especially in federal universities. It is already used by many universities such as the Federal Universities of Ceará, Piauí, Goiás, Pará, Amapá and others states.

IV. RESULT OF DATA RESEARCH AND DISCUSSION

We grouped the 60 (sixty) surveyed universities into three distinct groups separating them by administrative nature. The feds representing 68.34; the state with 11.66% and private individuals representing 20% of the total number of universities surveyed.
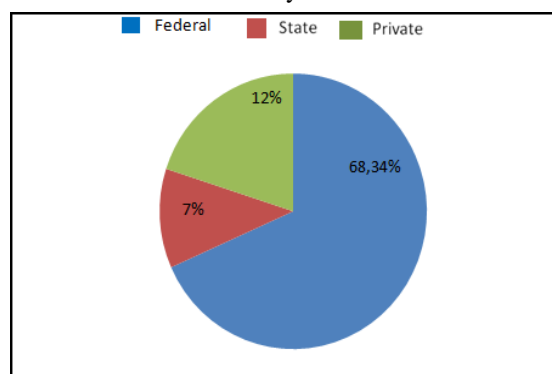

Figure 1. Grouping of universities by administrative nature: Federal, State, Private.

In the group of feds are contemplated those of all the states in the attempt to obtain a solid representation of all the regions of the country. In addition, some federations with regional influences such as the Federal University of Santa Maria in Rio Grande of Learning Management

Systems, the Federal Universities of Lavras - UFLavras, Viçosa - UFV and Uberlândia - UFU in Minas Gerais and many others with regional influences are part of this study. (Fig. 1.)

In the group of state and private, the representation was mainly of the South and Southeast regions where the largest universities are concentrated. The only exceptions were in the case of the state entered the State University of the Southwest of Bahia of the northeast region and in the group of the private entered the PUC of Goiás of the region Center West.

In the total of the Brazilian universities surveyed, 14 (fourteen) virtual learning environments were found and some of them, mainly the larger, using more than one environment.
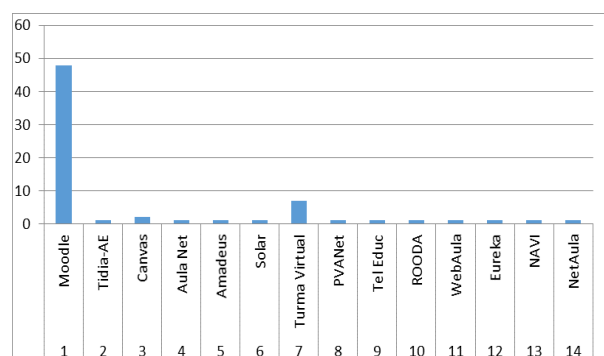

Figure 2. LMS found in the 60 (sixty) universities searched.

Moodle, Navi and Rooda the Federal University of Pernambuco - UFPE (Amadeus and Moodle), University of São Paulo USP (Moodle and Télia-AE), the University of Campinas - UNICAMP with the (Moodle and TelEduc). In addition, the only one that uses two environments is the Pontifical Catholic University of Rio de Janeiro - PUC - RIO that uses AulaNet and Moodle. (Fig. 2).

The universities that do not use Moodle are, the Federal University of Viçosa – UFV, that uses its own environment that is PVANet, Lutheran University of Brazil ULBRA that uses NetAula, the Federal Universities of Rio Grande do Norte, Paraíba, Federal University Rural of Rio de Janeiro, Federal of the Recôncavo Baiano, Cariri, Itajubá and Federal of South and Southeast of Pará that use the Virtual Class, the Pontifical Catholic University of Paraná - PUC - PR that uses Eureka and Pontifical Catholic University of Minas Gerais - PUC - MG that uses the Canvas.

Of the sixty universities surveyed, 48 (forty-eight) use Moodle, 7 (seven) use Virtual Class, 2 (two) use Canvas and the other mentioned environments are used by only one of the universities, usually its creator.

V. CONCLUSION

Faced with the data collected and analyzed it is noticed that at the end of the twentieth century some of the great Brazilian universities created their own virtual learning environments. This happened with AulaNet created by PUC of Rio de Janeiro in 1997, Eureka created by PUC of Paraná in 1998 and TelEduc created by UNICAMP also in 1998.

With the emergence of Moodle and its spread to the world at the beginning of the current century, software belonging to the group of free software, that is, has its source code open.

This means that anyone interested can copy it, transform it and distribute it only with the commitment that the result also remain with open source so others can do the same.

Together with this freedom to copy, transform, and flexibility in the process of customization of the environment to the needs of each institution, many Brazilian institutions have been attracted to adopt this platform as a virtual learning environment. Besides these two points already mentioned, it is added the fact that this software has a powerful community of developers around the world that guarantees its constant updating and innovation.

In addition to the preference for Moodle as a virtual learning environment in Brazilian universities, the research also shows, despite a somewhat shy appearance, but taking into consideration the creation time, for the Canvas that despite not being a free software, but is a software that has a great flexibility to adapt and is hosted in the clouds becomes very easy to install and with much more security than its competitors. In the universe of the sixty researched universities, two have already joined the canvas, the Methodist University of São Paulo and the PUC Minas Gerais. Knowing whether this number will increase in the next few years will only tell time. But due to the consistency presented by the product, both in relation to the ease of installation and security, it is perceived that this could have a great possibility of happening. Another tool that is also surprising is the Virtual Class, a module that is part of SIGAA, created by the University of Rio Grande do Norte, and has been adopted by several other universities, is also one of the highlights in this research. In addition to the supremacy of Moodle in terms of the number of institutions that use it, Canvas and SIGAA stand out as new possibilities both as a tool to foment the interactive process in Distance Education courses and in support of classroom courses.

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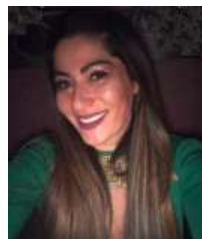
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