Composite Evaluation Process Interface Moodle

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Summary: Studying is a right of every citizen and, with the popularization of the Internet, making Virtual Learning Environments (VLE) is usable for any profile of a citizen is the duty of professionals Usability Engineering. Thinking also ensures that the virtual environment, this paper studies the Moodle system interface through techniques of usability engineering. The proposal is to find, through user tests, heuristic evaluation and modeling of user profiles, obstacles that do not allow the virtual learning environment better assessed from the available market, the system Moodle, enjoyable, simple and intuitive to use both by students and teachers. The problems identified in all the cited tests were registered for other developers to correct. So with the flaws corrected, the teacher should be concerned only with what is in their intrinsic knowledge, because all the technical details are abstracted, making it the natural process of publishing content and interaction with students. The environment used to obtain content and interaction with the teacher should follow the same characteristics, so that students feel motivated to interact with the environment of study and knowledge sharing.

Keywords: *Moodle, Personas, Virtual Learning Environments, Heuristic Evaluation, User Testing, User Profile Modeling.*

1. Introduction

The purpose of this paper is to study concepts that is becoming increasingly important with the growing number of users of computer systems, such as Usability Engineering and User Profiles, and apply these concepts in Moodle, also used by the FEI University Center, which was the setting for this study. The article presents a composition of methods that make more efficient the process of planning, implementation and analysis of results for improvement of the Moodle interface.

2. Virtual Learning Environments (VLE)

The AVAs are characterized by management courses or virtual classrooms, each with at least two types of users (tutors and students). Provide tools to perform virtual activities such as discussion forums, chats (chats), surveys and questionnaires. Offers resources for administrative control, for example, academic management, which encompasses the situation of the student in the course notes, and control over subjects studied (Ribeiro, 2007).

The use of AVA is becoming increasingly present both in traditional education institutions, within semi-presence modality and non-presence classroom, and in companies, known in corporate universities (Azevedo, Souza, 2009).

Currently, there are many virtual learning environments in the market, and in view of the characteristics of adaptation, (Ribeiro, 2007 apud Graf; List, 2005) used the approach QWS (Qualitative Weight and Sum) to evaluate some of these free environments. The Moodle environment won first place overall in addressing the adaptability, customization, extension and adaptation of the environment facing the reality of the institutions.

3. Interfaces Evaluation

According Baranauskas and Rocha (2003), we can say that evaluation has three main objectives: to evaluate the functionality of the system, evaluate the effect of the interface with the user and identify specific problems of the system.

Heuristic evaluation is a usability evaluation method where an evaluator seeks to identify usability problems in user interface, through analysis and interpretation of a set of principles or heuristics (Nielsen; Molich, 1990). According to Nielsen and Molich, this method is based on the judgments of the evaluator, and usually finds 75% of usability problems.

Usability testing with user participation and simulated in a controlled environment, allows specialists to visualize the interaction of users with the real system, focusing on the difficulties that in fact belong to that user profile and that perhaps might not have been found by experts.

4. User Profiles

The increase in the number of expected users and the diversity among them make it clear differences in their behavior, needs, skills and computer experience. This variety of characteristics and profiles imposes a great challenge to designers, which is to develop a product accessible to all user profiles that use the system (Aquino Jr., 2008), in this case Moodle. To facilitate the development process, you can group users that share similar characteristics with a method of modeling the user's profile, such as *personas*, so the number of different profiles can be radically reduced.

Personas are fictional characters more fully characterize a group of people. They must have a name, image characteristics and to add realism and facilitate its implementation, communication and recognition among professionals who will use them (Cooper, et al., 2003).

5. Composite Evaluation Process Interface

To increase productivity in application interface VLE evaluations, this paper defines the composition of methods, such as user modeling, heuristic evaluation and user testing.
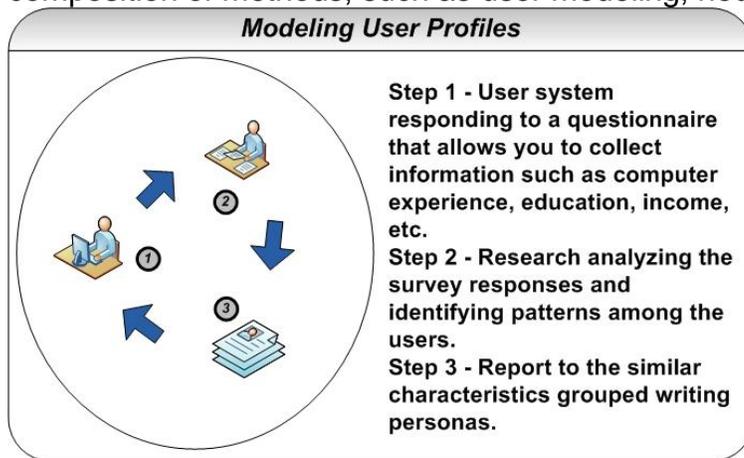

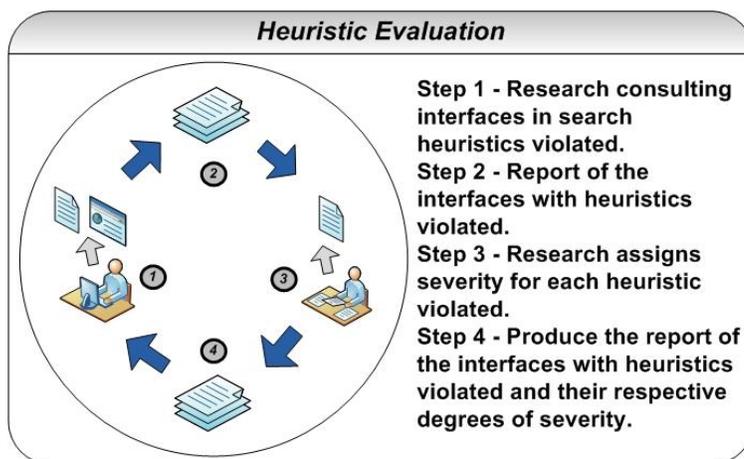Figure 1: Process Modeling User Profiles

Questionnaires were developed modeling profile for students and teachers, thus enabling the creation of *personas*. To analyze the data obtained in this research we used the WEKA (WEKA, 2011), software that allows you to choose an algorithm to mine the data. The algorithm used in this study was to clustering, which allowed the grouping of data to create *personas*. The diagram illustrates the steps comprising the user profile modeling performed in this study (Figure 1).

To perform this test were walked interfaces of commonly used functions of Moodle, the demand for usability flaws. The flaws found were recorded with the image of the interface, heuristic violated and the corresponding degree of seriousness. The diagram illustrates all the steps that made up the heuristic evaluation performed in this study. This method was used to the interface of the system was fully evaluated, finding usability faults that can represent an obstacle for users (Figure 2).

The infrastructure of the laboratory used for testing with users is formed by one room, divided into two parts by a mirror, and computers. The use of the resource "false

Figure 2: Heuristic Evaluation Process

mirror" for testing the user decreases the interference by people in the testing procedure, because the evaluator is isolated by observing the user. Thus, the test result becomes more assertive. Before starting the test, volunteers were informed users about the ethical and signed an authorization for filming. Beyond the capabilities of traditional software installed on computers in
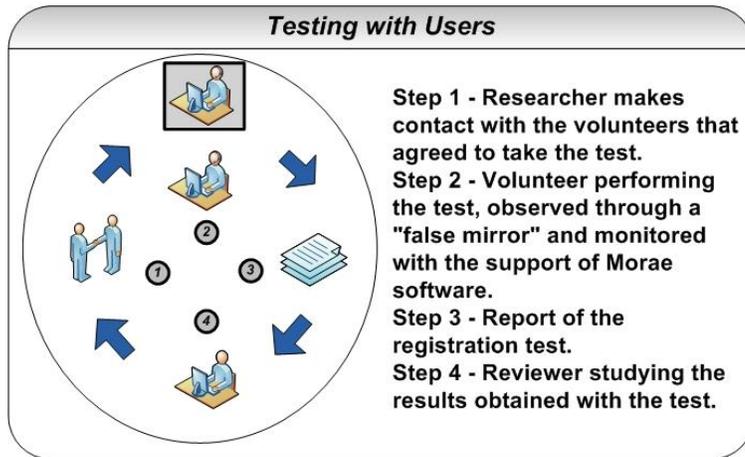
Figure 3: Process Test with Users

the laboratory, we used the Morae (2011), a software support usability testing, which allows recording of a desktop computer simultaneously with the video and audio user that can be viewed on another computer in real time, connected by network. Thus, the software enables the visualization of the interaction that can be assessed based on comments and reactions to the user's body, thus, the efficiency of the test be expanded. The diagram (Figure 3) illustrates all the processes that formed the user testing.

6. Results

This section presents summaries of the results obtained by different tests applied in this project. The full study, with all evaluation results can be viewed at (in Portuguese):

http://www.fei.edu.br/~plinio.aquino/usabilitymoodle/

6.1. Modeling User Profiles

Based on responses from 696 students of the University Center of FEI, the Weka generated from a clustering algorithm, two clusters that were studied to compose the *personas*, below:

	Leonardo Nogueira Xavier - 19 years old, single, lives with his parents.
	Thoughts: "Challenges logical? I decide that I can leave! "- Represents 61% of students
	Student of the 4th cycle of Engineering. Access the Moodle sometimes we are not always the tool meets your needs. Do you think Moodle is generally good, after all, he always does everything you need with ease and believes that both teachers and students are trained to use the tool.
	Alexandre Gomes Ferreira - 24 years old, stable relationship, but lives with his parents.
	Thoughts:: "I have to strain to pass this semester, the course or I'll Jubilee!" - Represents 39% of students
	Student of the 9th cycle Engineering. Access the Moodle once in a while, since not always the tool meets your needs. But in general think Moodle is good, even having a little trouble doing what you need and believe that only students are prepared to use the tool, teachers do not.

Based on responses from 72 teachers of the University Center of FEI, the Weka generated from a clustering algorithm, two clusters that were studied to compose the *personas* that are detailed:

	Ricardo Tanaka Kayo - 49 years old, married, lives with his wife.
	Thought: "In my time was different: the student had to struggle with their studies, but repeat the year. Today people want this done. "- Represents 58.4% of teachers
	Is a professor of Engineering since 2000. Access the Moodle sometimes even thinking that the tool meets your needs. Overall, Tanaka evaluate Moodle as a good tool, even having a little trouble doing what they need and believes that both students and teachers are trained to use it.
	Carlos Manuel Nóbrega - 35 years old, single, lives alone.
	Thought: "I dedicate 100% of my time to my career" - represents 41.6% of teachers
	Is a professor of Engineering since 2005. Access the Moodle at times, but think that the tool meets your needs. In general, Carlos evaluate Moodle as a good tool, since it can do everything you need with ease, as well as students and some teachers.

The creation of *personas* helps fit a profile the students and teachers who participated in the test with users, thus allowing the analysis of the results difficult to find possible patterns in each profile modeled.

6.2. Heuristic Evaluation

In heuristic evaluation test 20 interfaces were inspected and identified an average of 4.65 errors per interface. The summary record of usability faults found is shown below:

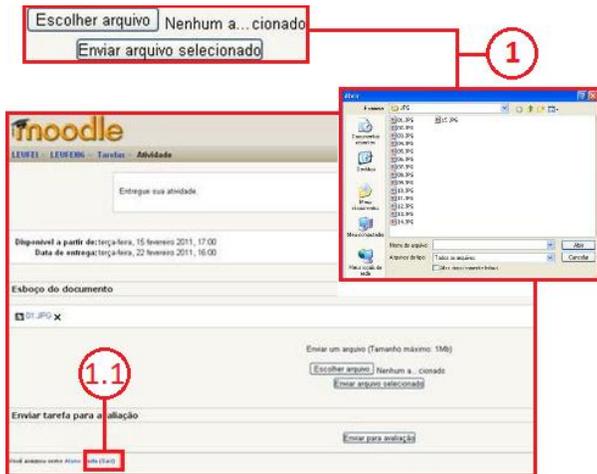**Interface #01** (with login student) - Submission of Activity

Figure 4: Submission of Activity

Description:

1 - For this option to work the user must perform an extensive sequence of steps and confused in a new window.

1.1 In this screen the user has already uploaded the file, but not yet submitted. The submission of the activity will happen when they click the button "Send for Review", which is separated within submission. The output is not clearly marked, and can confuse the user into believing that this only closes the session out of the window where he is, when in fact the system logs you out on all windows.

Heuristics violated:

1 - HCSCW09; HCSCW07; HCSCW03

1.1 - HCSCW10; HCSCW09; HCSCW06

Severity Levels:

Label 1 of Figure 4 - Level 3 (Biggest usability problem. High priority for correction)

Label 1.1 of Figure 4 - Level 3 (Biggest usability problem. High priority for correction)
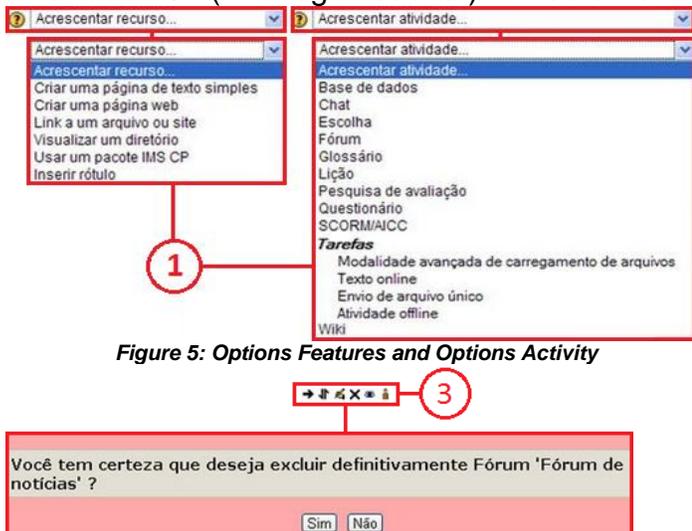
Interface #02 (with login teacher) - Enable Editing Course

Figure 5: Options Features and Options Activity

Figure 6: Bad shortcut icons

Figure 7: Options to add

Figure 8: Administration Options

Description:

1 - The user can get confused by not understanding the difference between "resource" and "Activity."

2 - Many of the options "Add" cannot be easily understood, and have no help page.

3 - Most of the symbols that appear to represent the options for editing the page are not easily understood, even after placing the mouse over it and get a description. In addition, by selecting the delete option appears the new interface that does not follow the pattern of the others.

4 - The "Disable editing" is not clear what he does and even after clicking it is difficult to understand their function, because the changes are subtle on the screen. In addition, there is the same option in two different places of the interface, giving the impression that they are two different things.

5 - Some options do not make clear what they do, and do not have the help page.

Heuristics violated:

1 - HCSCW10; HCSCW09; HCSCW02

2 - HCSCW10; HCSCW09; HCSCW02

3 - HCSCW10; HCSCW09; HCSCW04; HCSCW02

4 - HCSCW10; HCSCW09

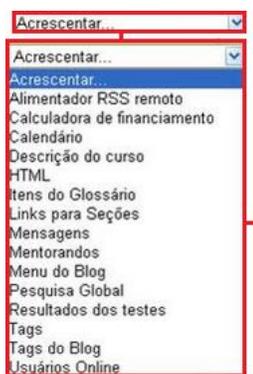5 - HCSCW10; HCSCW09

Severity Levels:

Label 1 – Figure 5 - Level 3 (biggest usability problem. High priority for correction)

Label 2 – Figure 7 - Level 3 (biggest usability problem. High priority for correction)

Label 3 - Figure 6 - Level 3 (biggest usability problem. High priority for correction)

Label 4 – Figure 8 - Level 3 (biggest usability problem. High priority for correction)

Label 5 – Figure 8 - Level 3 (biggest usability problem. High priority for correction)

6.3. Testing with Users

Among the 36 students that participated in the test, 15 had a profile similar to the *persona* Alexandre (41.66%), and 21 had a profile similar to the *persona* Leonardo (58.34%). From the 11 teachers who participated in the test, six had a profile similar to the *persona* Ricardo (54.56%), and 5 had a profile similar to the *persona* Carlos (45.45%). In the test performed at the interface of delivery activity, 55.56% of students had some degree of difficulty, but managed to complete the
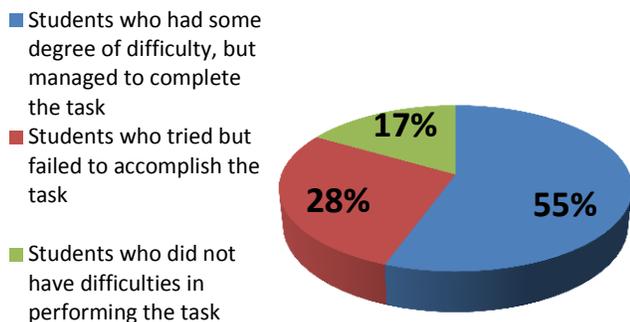
Figure 9: Percentage of students with difficulty in the submission interface activities

task. Of these, 45% had a profile similar to the *persona* Alexander and 55% had a profile similar to Leonardo *persona*. In the same interface, 27.78% of the students tried but failed to complete the task. Of these, 30% had a profile with the *persona* perished Alexander and 70% had a profile similar to Leonardo *persona*. This interface has damaged 73.33% of people with a profile similar to the *persona* Alexander and 85.71% of people with a profile similar to Leonardo *persona*. In the configuration interface

of course, 63.63% of teachers had some degree of difficulty, but managed to complete the task. Of these, 57.15% had a profile similar to Ricardo *persona* and 42.85% had a profile similar to Carlos *persona*. In the same interface, 18.18% of the teachers tried, but failed to complete the task. Of these, 50% had a profile similar to Ricardo *persona* and 50% with Carlos *persona*. Still in the same interface, 9.9% of teachers attempted to perform the task. Of these, 100% had a profile similar to Ricardo *persona* and 0% with Carlos *persona*. This interface has damaged 100% of people with the profile similar to Ricardo *persona* and 80% of people with a profile similar to Carlos *persona*.
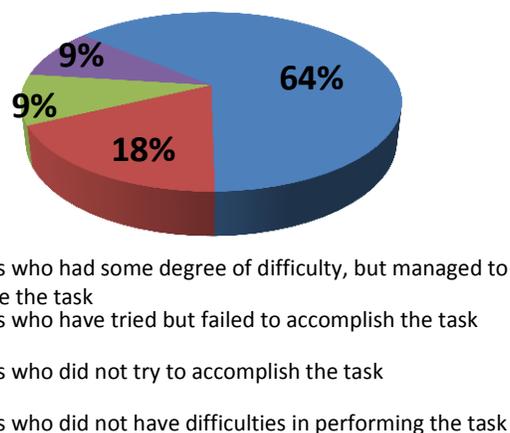

Figure 10: Percentage of teachers having difficulty in setting the course interface

7. Conclusion

Based on the results obtained by testing with users, we can say that the usability flaws affect all users regardless of their profile. In the environment of the students, on average, visited the set of interfaces by Leonardo *persona*, damaged 65.71% of users with this profile. Since the set of interfaces *persona* visited by Alexander hurt on average 61.33% of users with this profile. In the environment of teachers, on average, visited the set of interfaces by Carlos *persona*, damaged 51.42% of users with this profile. Already visited the set of interfaces by Ricardo *persona*, damaged on average 59.52% of users with this profile. Could not find patterns of problems specific to a profile, because the interfaces usability flaws that had undermined all *personas*, no major differences in percentages. The system presents Moodle usability issues in several of its interfaces and must undergo several changes to suit the users in question.

This article was objective share with the Moodle community a complete evaluation of usability that can be replicated in any version of the tool. It also features a format of documentation errors based on *persona*, focusing on the profile that can be helped with the solution. And finally shares the complete set of errors found during the execution of this project with duration of one year.

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