# Are Chats and Forums accessible in e-learning systems? A heuristic evaluation comparing four Learning Content Management Systems

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## ABSTRACT
This paper presents a heuristic evaluation of accessibility of the Computer Supported Collaborative Learning (CSCL) tools: chat and forums in four Learning Content Management Systems (LCMS): Moodle, ATutor, dotLRN and Claroline. Moreover, some recommendations are offered in order to improve the accessibility of the tools.

## Categories and Subject Descriptors
K.3.1 Computers & Education: Computer Uses in Education: Collaborative Learning

## General Terms
Verification, Human Factors

## Keywords
Accessible chats, accessible forums, heuristic evaluation

## 1. INTRODUCTION
Educational centers combine their traditional classroom-based learning with web-based e-learning systems based on LCMSs. They offer a wide variety of tools to collaborate or share materials. Some of these collaborative tools are: chats and forums. However, some students cannot use them because they have accessibility barriers. Thus, a heuristic accessibility evaluation is carried out to evaluate if the chat and forum of Moodle, ATutor, dotLRN and Claroline are accessible. After that some recommendations are specified to improve their accessibility.

## 2. HEURISTIC EVALUATION
The LCMSs evaluated are: Atutor 2.0.3, Claroline 1.10.6, dotLrn 2.4 and Moodle 2.0.5. The evaluation checks the accessibility basing on the ATAG 2.0[1] and the WCAG 2.0 [2] guidelines.

According to the results, the most accessible chats are the chats of Moodle and ATutor, because they accomplish more guidelines of A priority level and they try to solve one of the specific accessibility problems of chats, the auto-refresh. The most accessible forum is the DotLRN's because it fulfills more A priority level accessibility guidelines. However, all of the tools have accessibility problems and none of them help the author to create accessible content. A complete list of accessibility barriers is shown in the website http://labda.inf.uc3m.es/Evaluations (Password: EVALUATIONS)

## 3. RECOMMENDATIONS
- **Provide textual information:** provide textual information for non-textual content
- **Keyboard:** allow to control the tool with keyboard.
- **Skip content:** include mechanisms to skip content or use shortcuts.
- **Avoid errors:** the tools should help the author to avoid errors like sending blank messages.
- **Web standards:** create webpages and style sheets without code errors and according to the web standards.
- **Check accessibility:** inform the authors about the accessibility errors and how to solve them.
- **Accessibility documentation:** provide documentation related to accessibility features and how to create accessible content.

Specifically for chats, it is really important to allow users to stop, control and adjust the auto-refreshing time of the sentences.

Finally, the forum tool should check the accessibility of the content generated by the authors. The tool should check the accessibility; inform the authors if there were accessibility errors in the content and help users to solve these errors.

## 4. ACKNOWLEDGMENTS
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## 5. REFERENCES
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[2] W3C. Web Content Accessibility Guidelines. 2008. http://www.w3.org/TR/WCAG/