

Minecraft : A novel mind mapping tool under Moodle platform

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Abstract. In this work, we present a novel developed plugin, Minecraft integrated to the Moodle platform. It gives the opportunity to teachers to create mind maps. It is an interactive and collaborative tool used to structure information by connecting ideas and concepts using personalized and rich mind maps.

Keywords: Mind mapping, Moodle, Minecraft

1 Introduction

e-learning is getting to be developed in Tunisia thanks to the Virtual University of Tunis VUT. The e-learning Moodle (Modular Object Oriented Dynamic Learning Environment) [4] platform is installed and managed by the VUT. Moodle is an educational platform designed to create customized, interactive and collaborative e-learning environments. The aim of this work is to integrate to moodle, a collaborative and interactive online activity for mind mapping. In this context, we have developed in June 2015, a new mind mapping plugin. This tool can be used in several domains such as training sessions at the VUT, in medicine, entrepreneurship, etc. This work is the result of the collaboration between the department of virtual education at the University of Manouba and the VUT.

2 Mind Mapping approach

Mind mapping is an interesting approach for brainstorming and idea generation, used to facilitate structuring of items, concepts, ideas, etc. of a given problem [2]. It consists in presenting a central idea, connected to it other ideas in a hierarchical manner. For instance, organization of concepts in a course, a case study in medicine, a project in entrepreneurship, etc. It also stimulates creation, reflection

and innovation, while saving time [2]. It avoids falling into a chaos by managing a large amount of information without losing important details. Online interactive and collaborative mind mapping tools can be used to structure concepts and ideas between multiple users. Sharing ideas, discussion, logical thinking and synthesis become easier.

3 Mind mapping under Moodle

The online learning platform Moodle does not provide a mind mapping tool, able to satisfy basic requirements of communication and collaboration between teachers and students about concepts, ideas, projects, etc. represented by a mind map.

To create mind maps, the Moodle plugin named "Advance mind map" [1] can be used. There is no collaborative aspect in its version number 2014080500. Therefore, this plugin is not very useful and doesn't satisfy users' needs. It doesn't offer any interactive aspects and relations between nodes are limited to only one level. Also, there is no way to customize nodes such as by using different colors, shapes, or by attaching media files, etc.

Teachers can also use an external tool to moodle that offers all needed features. For Moodle users, this kind of solution is not very interesting nor effective, and would make the learning/training process not very convenient.

Due to the lack of an interactive and collaborative mind mapping tools under Moodle, we propose to develop a new mind mapping plugin to be integrated to Moodle platform.

4 Developed plugin: Mindcraft

The process of developing and integrating the new plugin Mindcraft into Moodle, follows multiple steps. Different Web developing languages and technologies are used. From the client side, used technologies and languages are HTML5, CSS3 and JavaScript JS. As JS libraries, jQuery and GoJS [3] were used. GoJS was used as a main tool to manage maps (adding nodes, relationships, etc.). Ajax was used to manage submission of comments and saving maps. From the server side, the plugin was developed in PHP5 using the library offered by Moodle for plugin development. For data modeling, JSON was used for modeling maps and XML for modeling tables used by this plugin. A responsive web design was developed for this plugin to be adaptive for small screens and Moodle mobile application.

5 Presentation of Minecraft

When working in a group, interactive and collaborative aspects are important. The main aim of this work is to develop a plugin to be integrated to Moodle offering the same features as any powerful mind mapping tool external to Moodle. The mind mapping developed tool is named Minecraft. This tool is useful for making analyzes, summaries, taking notes and facilitating memorization of concepts under Moodle.

This application looks to structure information by connecting ideas with logical links and associations between them. It allows to focus on details while keeping a global vision of the problem under consideration. It helps to clarify ideas by presenting them with images, links, media files, colors and shapes.

The user has the ability to customize maps, in collaboration with other users. The visual rendering may be more attractive, more representative, easy to understand, more accepted into a group and then easily transmitted, since it represents the result of collaborative work obtained with consensus. Minecraft, the new Moodle plugin offers different features for students and teachers.

Main features offered by Minecraft for teachers are creation, updating and deletion of mind maps, nodes and links. The teacher starts by adding a new Minecraft activity under Moodle. The name of the mind map, its description, the number of maps and if maps will be interactive, are specified in the creation interface.

The list of available and created mind maps is then shown to the teacher, with different information about state, creation and last updated dates. When clicking on a map, the teacher has the possibility to add nodes to the new created mind map. The main problem node is displayed automatically as presented in figure Fig.1. The mind map can be then, renamed, validated or deleted.

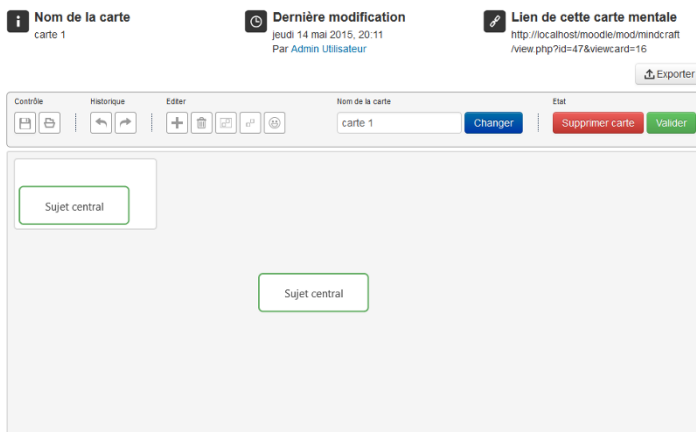


Fig. 1. Interface for managing a mind map

Each node in a mind map can be customized using different descriptions and shapes. Colors of texts, borders and backgrounds can be modified. To each node,

pictures, hypertext links and files can be attached. Relations or links between nodes are allowed at different levels with different shapes and colors. Discussions about nodes can be accomplished between users using a comment system.

Collaboration between teachers is also implemented by tracking changes on nodes and managing different versions. Added files can be downloaded and hypertext links can be visited by collaborators. If the map is validated by the teacher, it can be then, displayed to students and exported as a picture.

Main features offered by Mindcraft to students are consultation of created and validated mind maps, which can be downloaded as a picture. Hypertext links can be visited and files can be downloaded from each node. Discussion by a comment system can be started on each node between teachers and students.

6 Conclusion

Mind mapping is an interesting approach for extracting, storing, structuring and sharing information [2]. It is very useful in education to summarize important concepts and explain links between them. Online mind mapping tools are then needed, to take advantage of different benefits of mind mapping.

This work proposes a novel plugin for a collaborative and interactive mind mapping tool under Moodle platform. This approach represents several features for teachers and students. Mindcraft was developed under the version 2.8 of Moodle and it is still compatible with the versions 2.9 and 3.0. Mindcraft 1.0 is still under the approval process from the Moodle community. We are already working on a new version, Mindcraft 2.0, presenting important additional features, such as the possibility to choose the map's type (mind map, flowchart, Gantt, UML diagram, etc.). Users (teachers and students) will be able to collaborate into groups to create a new map. Assessment of students will be done also under Moodle. This new plugin can be used to boost creativity of learners and collaboration between them.

References

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