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Use Wiki for Building an On-Line Collaborative Learning

Ann Zeki Ablahd *

Department of Computer Technique
Technical College of Kirkuk
Kirkuk
Iraq

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A B S T R A C T

It is important step to use a new technology for collaborative learning. The aim of this research is to facilitate collaborative learning group, increase a skill of learning, extending the knowledge of wiki in building online web collaborative learning activities system of computer science departments, by development a standards learning using free collaborative Wikispaces. The built system is called ComWiki. The ComWiki is an online collaborative system for learning. Includes delegation and Coordinate of responsibilities between group of members and share their opinions and ideas. The responsibilities such as exchange of views and important information, experiences of different professors with interaction between them. This work is published in http://ccomwiki.wikispaces.com. ComWiki is used mechanism for adding a trust more than others by enhancing online cooperative and collaborative education in using a non-open source Wikispaces application. ComWiki support a protection media for all information to prevent changing by web users and ease of use. ComWiki has a different media of learning like pictures, videos, text, chatting.

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استخدام ويكي لبناء التعلم التعاوني عبر الانترنيت

الخلاصة

التعلم التعاوني يعتبر من أهم نتائج التكنولوجيا الحديثة. إن الهدف الرئيسي من هذا البحث هو بناء نظام تفاعلي وتعاوني لتعزيز العمل الجماعي وتبادل الأفكار والآراء وتخصيص الأدوار لتسهيل عملية التعلم في اختصاص علوم الحاسبات. أن عملية البناء هنا تؤدي إلى زيادة مهارة التعلم، وتوسيع نطاق المعرفة في استخدام الويكي (Wiki) . تستخدم الويكي في بناء أنظمة التعلم والتفاعل والتشارك بالمعرفة عبر شبكة الانترنيت. من خلال إعداد أنظمة جديدة على شبكة الإنترنت يتم استخدام آلية جديدة لإضافة الثقة أكثر من غيرها من خلال تعزيز التعليم التعاوني على الانترنت في استخدام التطبيق غير مفتوح المصدر WikiSpaces. ويدعم النظام المقترح وسائط حماية لجميع المعلومات لمنع تغييرها من قبل مستخدمي الويب وسهولة الاستخدام وتحديث وسائل الإعلام المختلفة من التعلم مثل الصور والفيديو والنصوص، والدردشة، الخ. أطلق على النظام المعد ComWiki. ComWiki هو نظام تفاعلي على شبكة الانترنت يستخدم لتعلم مفردات أقسام علوم الحاسبات. ويشمل تفويض وتنسيق المسؤوليات بين مجموعة من الأعضاء ومن أهم هذه المسؤوليات إعداد المحاضرات، تبادل وجهات النظر والمعلومات الهامة والخبرات المختلفة للأساتذة مع التفاعل بينهم. ويمكن تنفيذ النظام المعد عن طريق http://ccomwiki.wikispaces.com.

1. INTRODUCTION

The collaborative learning is a complex process, where tends to be an environmental process, which is affected by information, social interaction and experience [1]. The interested designing done by focusing about the course to link the information presented in reality using the appropriate media of pictures, video and texts, chatting..., etc. Where the information is collected and re-written in a way that allows the student to use it and to ensure the achievement of learning. As the essence of educational design based on the perception of learning outcomes and then identify appropriate strategies to get attractive outputs.

1.1. Wikispaces

There are two available type of creating wiki. The 1st type is to use a wiki program such as MediaWiki, TikiWiki and DokuWiki which are installed on a hosting server. But 2nd type of wiki does not need a hosting server. The user opens an account, create and manage it like Wikispaces, PeanutButterWiki , Seedwiki,…etc. ComWiki is built by using the semantic of WikiSpaces [2].

* *Corresponding author: E-mail* : ann_zeki2001@yahoo.com

Wikispaces is a free software in internet that permit the web user to share his works, ideas, photos, links, videos, educational materials, announcements, instructions, directives, laws, and anything else can web users think of them. This software offers a set of tools that makes easy sharing of all types of files for students or their lectures [2]. The advantage of wikispaces are:

- Develop the sense responsibility of students. - Developing the critical level of thinking for learners.
- Developing literacy skills and understanding of information.
- Developing methods of communicating and exchanging ideas with other, by text and image.

Fig. 1. Represent the home page of wikispaces.

The link of creating account of wikispaces is: www.wikispaces.com . After joining to this link a wikispaces home page will appear as in Fig. 1 that will wait to select the purpose of designing, education was selected in designing of ComWiki.Wikispaces where chosen because there is no need to install a program or provide a server.

There are three different permissions for setting of Wikispaces:

1. Private: It permits to edit or view by members only.
2. Protected: It permits to anyone to view only, members to edit it.
3. Public: It permits to edit or view by anyone. Fig. 2 shows the permission of Wikispaces.

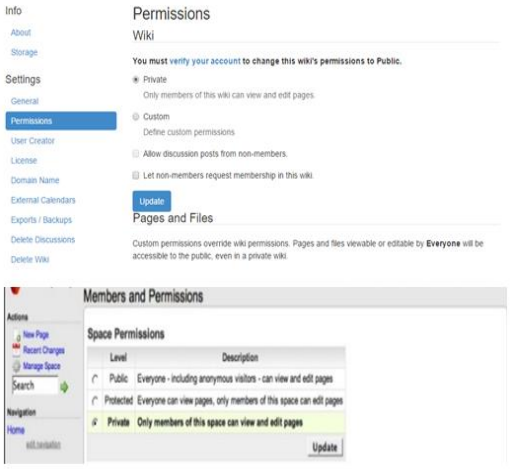

Fig. 2. Represents the permission of Wikispaces.

There are different terms of wiki and wikispaces in general such as:

-User Account: used to identify each wikispaces system by user name, password and e-mail address. (see Fig. 3).

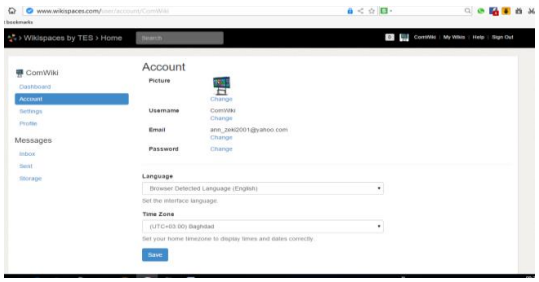

Fig. 3. Account of ComWiki.

Part of wiki to be collaborate.

Part of wiki to be collaborate.

Space: - - Page: The space consists of numerous pages. Fig. 4 shows terms of Wikispaces.

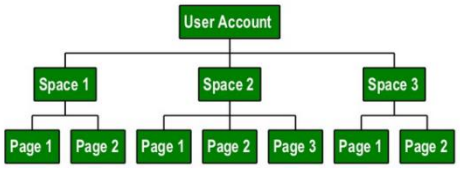

Fig. 4. Represent terms of wikispaces

2. THE ISSUES OF PEDAGOGICAL IN WIKIS

There are three elements of pedagogical in Wikis considered as a keys of them such as "web-based collaborative platform (WCP)", "collaborative learning method" (CLM)" and " scaffolding theory (ST)". Fig. 5 represent these keys [2]. At first the semantic of the wiki system is used as "WCP" among the members of the team which involve a collaborative action.

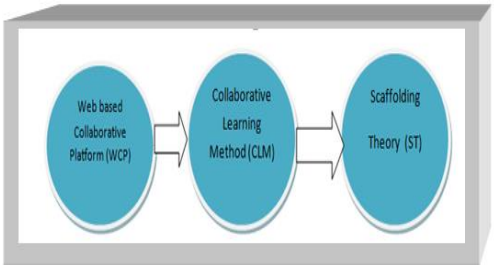

Fig. 5. Represent the keys of pedagogical in Wikis.

The "WCP" used for supporting the activities of learning. The "CLM" represents the principal activity of learning and the "ST" renders to be sure that the ComWiki is work successfully and smoothly and has the experience of instructors and easy for teaching [3]. In order to apply the collaborative action, a process of designing a pedagogy is used in designing ComWiki. The most important command of wikispaces that used in ComWiki is "Widget". This command adds features to wiki, like ease and flexibility wiki usage, which allow embedding applications from various sites on the internet to be used, including audio files, video, maps and news servers [2]. This command used in ComWiki for choosing YouTube videos, chatting and documents from "Widget" command. Fig. 6 shows videos, chatting shared with "Widget command.

Fig. 6. Show videos, chatting shared with Widget in ComWiki.

3. STEPS OF DESIGN COMWIKI

ComWiki is a proposed system was built using a free wikispaces application for learning a subjects of computer science department. There are several stages of ComWiki:

- Gathering of Information
- Architecture of ComWiki .
- Creating contents of ComWiki.
- Review

3.1. Gathering of Information

This stage is considered as an initial step of designing. Data of computer science was collected here. In this step the members and objective of ComWiki where delimited, topics of ComWiki is decided.

3.2. Architecture of ComWiki

This stage is responsible for building the architecture of ComWiki. ComWiki has three layers (database, application, user) as shown in Fig. 7.

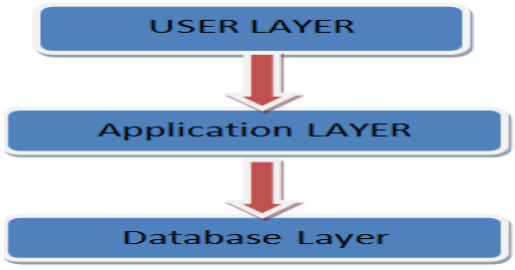

Fig. 7. Represent layers of ComWiki.

1. "Database Layer"

This layer is considered as a MySQL of database that served as basic warehouses for learning. This consists of the contents of database in addition to knowledge base. The knowledge base composed of ontology and semantic link stored as RDF ("Resource Description Framework") which represents the different semantics of relationships among the learning objects. The ontology specifies the conceptualization and domains of the specify application. This layer is an internal interface, hiding from users. It provides a database information view by applying the semantics schema of database [4].

2. "Application Layer"

This layer composed of modules, interested in processing and switching the structured information, which is done by a semantic of web technologies. These modules are:

"Semantic template": It consists of reformulate text to pages by adding attribute template text or link and allows semantic annotation.

The advantages of that are the semantic data is stored as templates to provide a clear instructor for hiding and displaying the stored information pages. The user does not look for the right features through editing the page. To make the editing easy, the template used for editing the structure of all pages in one positions [5].

"Inline query": This module enables the editor dynamically adding tables, lists to page for updating the available query results. This module is easier in creation, maintaining, comparing between inline and manually editing listing, more perfect and accurate. "Parser": This module respon-sible for transforming the markup text of written wiki by user to "Hypertext Markup Language (HTML)". It tries to parse the text for links, semantics annotations.

"Render": This module responsible for occupying page dynamically depending on semantic templates, that decide the layout of display sent to user.

"RDF Feed": This module permit the page in RDF (Resource Description Framework) format to obtain data and direct access to formalized knowledge [6].

3. "User Layer UR"

The UR has a several functions such as:

"Interface": This function deal with designing displayed page (style of page) to distinguish the looking of ComWiki page layout like fonts, images, colors…, etc that is important to the users. Also this function enables the wiki to add a ComWiki in "Google search engine" inside wiki standard search box. Interface function add a button as a social networks like Twitter, Facebook,etc. to share ComWiki. "Home Page": The layout of home page consists of:

- Starting section which is designed to help the user, how to begin with ComWiki. Fig. 8 represent home page of ComWiki.

Fig. 8. Represents the home page of ComWiki.

- -Updated Section: This section concerned with displaying a list of recent updating of ComWiki.
- -Future Extension: This section used in ComWiki by adding a new thought for expansion of this wiki in future.
- -Course section which is developed to presents a collaborative learning such as Syllabus, Lectures, Books, Quizzes, ..., etc. Fig. 9 shows an e.g. of course section.

Each project consists of different activities like collaborative experience of expert member group. Where each project is done by a member group. The syllabus displays the semantic format such as the name, description

and the aim of course. Fig. 10 represents one example of designed syllabus in semantic format.

The course materials contain information about course semester, duration, start and end date, lectures …etc. See Fig. 11 shows an example of course materials.

The instructor who is a member of ComWiki can edit this system by upload, assign the title and date of his lecture. Fig. 12 shows lecture format. The ComWiki has the ability to remove old lecture and add a new one, Fig. 13 shows that.

Fig. 9. Represents courses section.

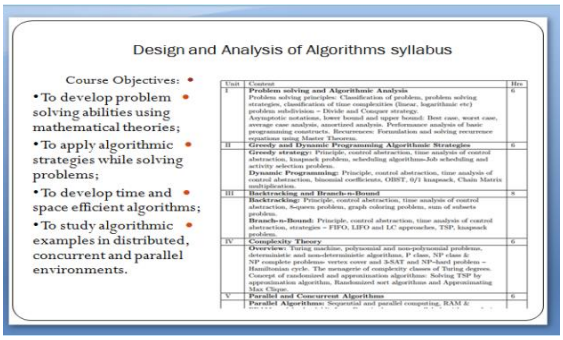

Fig. 10. represents a designed syllabus in semantic format.

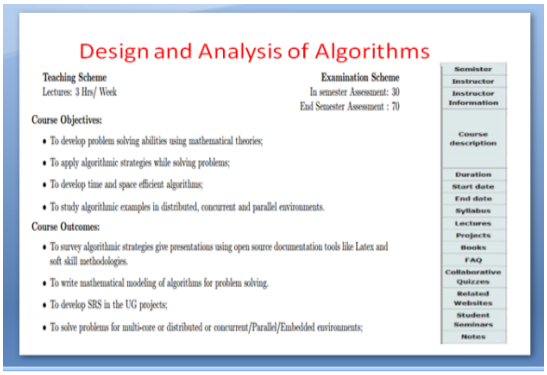

Fig. 11. shows example of course materials.

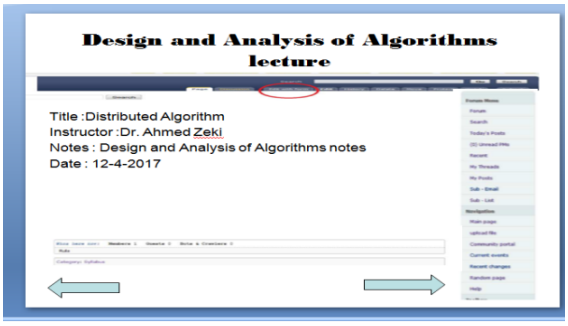

Fig. 12. Lecture format.

The "Source Book" contains a source book button for getting, purchasing books by identifying " ISBNs" of that book. Fig. 4 shows source book of ComWiki. The aim of quiz is to improve the powerful of ComWiki. Fig. 15 shows example of quiz.

The pages of user contributions used for displaying a new account that added to ComWiki or display the IP addresses, names of users. The date of joining is displayed too. Fig. 16 shows the contribution of users.

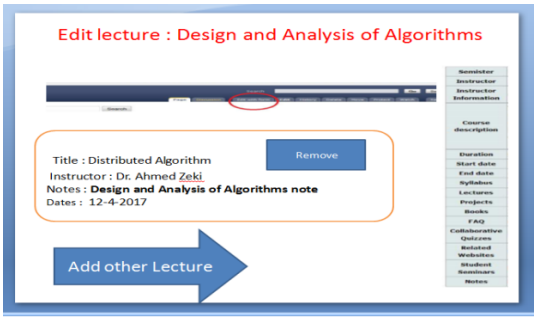

Fig. 13. Show editing lecture.

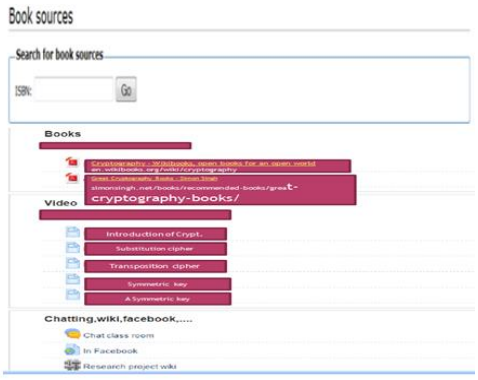

Fig. 14. source book form.

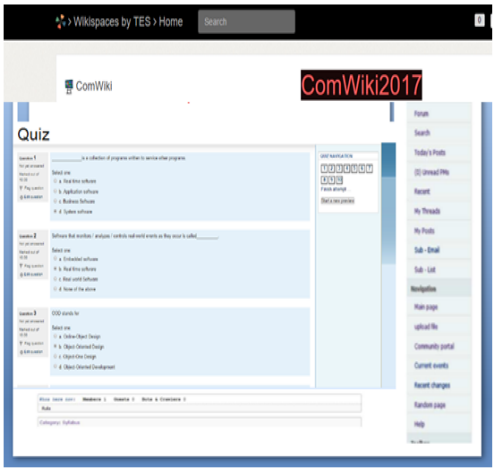

Fig. 15. displays example of quiz.

The E-search is the link to upload page from learner. Fig. 17 show E-search page.

"Help and Questions Page": This page consists of:

- Asking, answering and discussing questions.
- ComWiki has a different page with many instructions and several examples for helping the user in using this proposed system. "Editor ": It gives user the possibility of editing the permit pages because some pages is

private not allowed of changing by users only altered by a member group of ComWiki.

"Calendar": ComWiki contents an On-Line calendar. This system is programmed in adding a "Google calendar" type. See Fig. 18 represents "Google calendar".

Fig 16. shows users contribution.

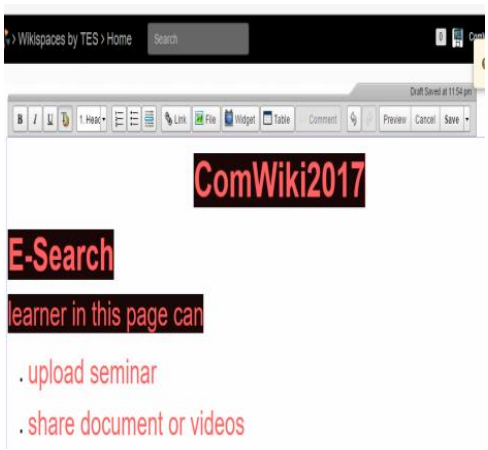

Fig.17. Represents E-search page.

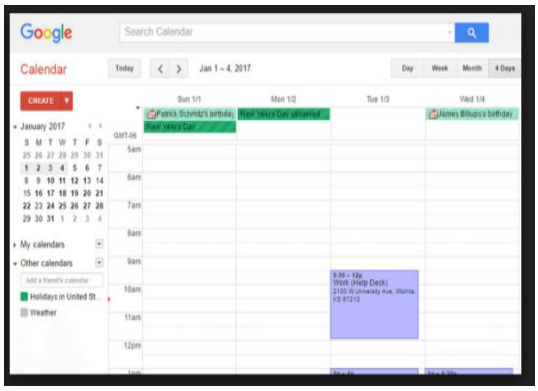

Fig. 18. Represents "Google Calendar ".

3.3. Creating contents of ComWiki

Through creating of ComWiki there were (5) types of users in this system like (registered administrator, expert, instructor, learner and visitor not registered) each type has its action according to the privileges of each type.

A. Visitor: This type includes any internet users that did not registered before. They view ComWiki without the ability to change the contents of it [7].

B. Learner: This type includes the registered persons who asked to take certain roles and orders.The actions done by several users are:

1. Create a new wikipage.
2. Editing the new wikipage.
3. Write a comment in existing wikipage.
4. Delete creating wikipage by them.
5. Renaming a wikipage creating by them.
6. View all public information.
7. Sending messages to all member of group.

C. Expert: This type includes the expert users that can perform all the functions of learner plus the actions like:

1. Delete a created wikipage by learner.
2. ComWiki has one expert for making the last decisions of ComWiki group. Expert control to all activity of learner within same group.

D. Instructor: The instructor capable of adding new courses and projects, assignments jobs and tasks to different members of team.

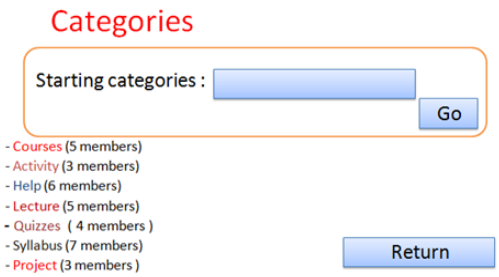

Fig. 19. Represents categories of ComWiki.

Instructor has the ability to create categories of users (see Fig. 19), read and replay to all post messages. Instructor control to all threads and he/she can detect and blocked [8].

E. Administrator: The responsibility of administrator is same as instructor in addition to adding, editing and removing all the users' restriction in a team such as users accounts, user group, and general maintenance configuration through settings.

Review

All team members test all projects and tasks that allotted to them. They used a draft copy page for testing if it works or not. After working properly, all activities should submit to be a completed task.

Security

In ComWiki system the way used to verify the security is control access. The control access is the authenticate of administrator for accessing to the private or public or protected information by different users. All team permission is stored as an array within the propose system as in Fig. 20.

That contains a column for type (e.g., expert), while other column represents the access type (like move file, upload, import…., etc.) and other column represents the permission (true, or false).

Evaluation

This part presents the analysis of a questionnaire of using the published side is http://ccomwiki.wikispaces.com . Total of 25 students participate with this question-naire, 88% (near 22 students)

strongly agree that ComWiki is informative and useful, 12% did not agree because they haven't net and they like the old way of learning and 0% in between.

The summary results seem to that most of students agree on using collaborative ComWiki because it is easy to use, has a Characteristics of security.

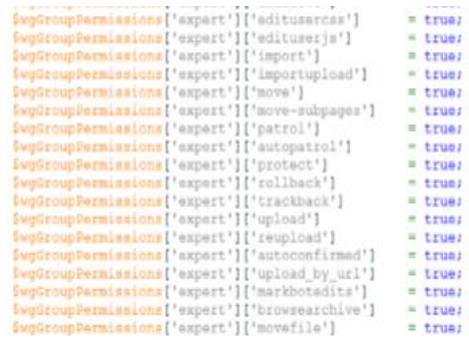

Fig. 20. represents part of expert table permission.

4. CONCLUSIONS

ComWiki is a mechanism used to improve the collaborative system of learning (develop and enhance the "Google search" and semantic wiki). ComWiki used to share network, calendar, and facilitate the collaborative learning, easy to use by students.

ComWiki used for enhancing the learning by open a discussion between students and instructors or between the ComWiki members, displaying lessons in attractive ways (by using pictures and videos ..etc.).The information of ComWiki has a top of security by using the private property from the staff of this system.

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