ISSN:0975-9646

Classroomwiki: Collaborative learning tool along with content relevancy predictor system

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Abstract—We are using wikis as tool to conduct group as well as collaborative learning and writing journal and assignment in classroom and university. However today wiki is cant not effectively solve the contribution manipulation of individual student in formed groups and performance of student cant be predicted. And we cant get the output of student submitted reports in most relevant topic manner. To improve these aspects, we have designed and implemented ClassroomWiki– Collaborative learning tool along with content relevancy predictor system. For the participating students, ClassroomWiki gives a web interface UI for writing and revising and communicating their groups Wiki and a topic-based forum for discussing and sharing their ideas during collaboration discussion. And student might search for other topics and get list of output assignment in most relevant first order. When the students study collaboratively, the results suggest that ClassroomWiki can 1) provide collaboration for students to improve there study by creating various students group 2) this will help assessor to calculate individual students contribution in formed group so that other student cant take credit of one students work and 3) provide the facility for teacher to interact with student and access there contribution in better way facilitate specific and precise teacher intervention with accurate and detailed tracking of student activities. 4) Analysis of most accurate and relevant assignment submitted for given topic. Index Terms Collaborative learning tool, Multiagent System

I. INTRODUCTION

Nowadays wikis becoming popular tool for implementing ideas generated through collaborative learning. Wiki environ-ments are presented in such a way that more and more infor-mation can be gained i.e. via webpages by using collaboration process, to generate information. The improvement of student in groups is mainly depends upon how they interact with each other and how they share knowledge and information with each other. One way to improve the collaboration, and thus, the collaborative learning outcome of the students in a Wiki is by addressing the important factors that impact the collaboration process of the students e.g., 1) group formation and 2) individual assessment of students. 3) Analysis of most accurate and relevant assignment submitted for given topic. The method used for forming student groups in a collaborative learning environment impacts the collaboration and the learning of the students because some groups of students are able to collaborate better than others. For example, researchers suggest that forming heterogeneous student groups that combine students with a variety of skills may help them collaborate better.

Researchers explain that the improvement in collaboration and learning in heterogeneous student groups occur since the students with different perspectives are able to exchange their ideas and skills with their group members. So, a Wiki that forms heterogeneous groups and analysis of most accurate and relevant assignment submitted for given topic, considering the knowledge and skills of the students would yield better collaborative learning outcomes (e.g., student performance, collaboration) than a Wiki that does not consider these factors. In addition, researchers indicate that accurate assessment of student contributions remains a difficult challenge to overcome in a collaborative learning environment.

II. LITERATURE SURVEY

In this literature survey section we discuss the motivation and idea behind this project and survey along with interview made for this project. Here we took reference from IEEE paper Classroomwiki: a collaborative wiki for instructional use for multiagent group formation by Nobel Khandekar. This paper gives the idea for generative system for collaborative study. Further we took reference from IEEE paper Lessons Learned from Comprehensive Deployments of Multiagent CSCL Applications I-MINDS and ClassroomWiki by Nobel Khandaker, Leen-Kiat Soh. These paper gives references for using collaborative learning tool along with group formation method. Further we added module of content relevancy pre-dictor system to this existing system to enhance performance and to give quick learning

A. Overview

Wiki environment setting results from the collaboration between the externalization and internalization method of the individual learners and they describe this co evolution from the collaboration of the two processes from the viewpoint of Piagets model of equilibration. This theory proposes that when the environments knowledge and a person's prior knowledge do not fall in line, it causes a cognitive disagreement which can be determined in two ways, through: 1) incorporation, i.e., by incorporating new matching information to the already existing information or 2) accommodation, i.e., by modifying the prior knowledge to better understand the environments knowledge

III. PROPOSED WORK

For the students, ClassroomWiki provides a web interface for writing and revising their groups Wiki and a topic-based forum for discussing their ideas during collaboration. And analysis most accurate relevant assignment submitted. When the students collaborate to study together, ClassroomWiki keeps tracks of all student activities and

there individual contribution and builds detailed student models that represent their help toward their groups. Even student can study with wide range of topic provided by teacher. Student can find most relevant submitted assignment for given topic using content relevancy predicator. For the teacher, ClassroomWiki gives a multiagent structural framework that uses the student models to form student groups to enhance the collaborative learning of students. They can give marks for most accurte student assignment and arrange all other assignment in there relevancy manner.

We can summarize classroom wiki problem definition as: 1) Improve the collaborative learning outcome of the students by its group formation framework, 2) Help the teacher better analyse a students individual contribution toward his or her group and avoid free riding, and taking unwanted advantage, and 3) Facilitate specific and precise teacher intervention with accurate and detailed tracking of student activities. 4) Analysis of most accurate and relevant assignment submitted for given topic.

A. Features

ClassroomWiki is composed of five conceptual modules as follows: 1. Wiki Module (WIM-Module), 2. Communication Module(COM-Module), 3. Tracking And Modelling Module(TAM-Module), and 4. Group Formation Module (GFM-Module). 5. Content Relevancy Predictor System (CRP) Wiki provides assignment to the group of students. For students in created groups, the WIM module allows 1) revision and 2) versioning of their Wiki assignment text. Second, COM facilitates student and teacher communications through 1) assignment-specific topic-based forums used by the teacher and the student groups and 2) announcements and e-mails from the teacher to the individual students or student groups. Third, TAM tracks students interactions with their group members and with the modules of ClassroomWiki to build a detailed student model. That model is then used to 1) better assess the students individual contributions toward their groups Wiki-related work leading to a) detection and pre-vention of free riding behaviour and b) precise and specific interventions from the teacher to improve collaboration and 2) better group formation. Fourth, the GFM allows the teacher to automatically form student groups randomly or by using the tracked student models and the MHCF framework. Finally CRP content relevancy predicator system do analysis of most accurate and relevant assignment submitted for given topic.

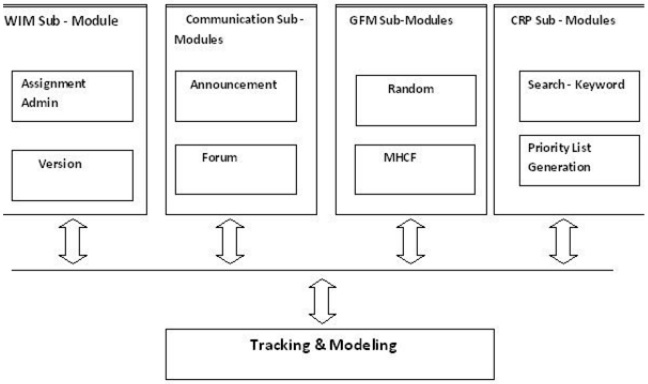
B. Scope

Wikis today are gaining popularity as a tool for implementing collaborative learning for instructional uses. Typical Wiki environments are developed to provide information of assigned topic such as webpages through collaboration, where the quality of the generated content is the focus. However ClassroomWiki– Collaborative learning tool along with con-tent relevancy predictor system provides following scope for student and teacher respectively

C. Objectives

Classroom Wikia web-based collaborative Wiki writing tool, for the students, to provides web interface for writing and revising their groups Wiki and a topic-based forum for discussing their ideas during collaboration.

IV. SYSTEM ARCHITECTURE



After specifying and analysing the requirements of the given task to be operated, the next step is to analyse the problem and understand its context during implementation. The first task in the process is studying the existing system find out drawbacks in that and other is to understand the requirements and domain of the new system and other details s well. Both the tasks are equally important and performed carefully, but the first activity serves as a basis of giving the functional specifications and then successful design and integration of the proposed system.

A. ***Wiki Module (WIM)***

The WIM allows the teacher to create and assign a topic to the student groups in the course. Once assigned by the teacher, the student groups collaborate to create a Wiki on that topic which is evaluated by the teacher after the due date of the assignment. The WIM consists of the assignment and the versioning component. The assignment component of WIM allows the Wiki teacher to create Wiki assignments for the participating students. The Wiki assignment specifies the topic, the requirements for the final submitted version (e.g., required sections, word limit, due date), and minimum size of the student groups. Once created by the teacher, the assignment component stores this specification which can then be accessed by the students (while they are collaborating) and by other 2 modules (e.g., the group size is used by the group formation module).

B. ***Communication Module (COM)***

Classroom Wikis COM consists of two components: 1) a topic-based forum and 2) an announcement system. The topic-based forum in the COM facilitates the collaboration process of the students in two ways. First, while collaborating, the members of a student group can discuss their plan or approach of writing the Wiki, their revisions, and other Wiki-related questions and comments in the forum. Second, the forum allows the teacher to respond to questions posed by the members of a student group for their Wiki. The announcement system allows the teacher to notify the students about changes or other assignment-specific matters.

C. ***Tracking and Modelling Module (TAM)***

Tracking and modelling principle: The Wiki should be able

to track and present the students contributions toward their group so that the scores they receive accurately represent the effort they have put in toward their groups final outcome

1. Active usethe actions of a student that push information onto his or her groups Wiki and change the content of that Wiki, e.g., the number of words: a) added, b) deleted, and c) rearranged.
2. Passive usestudent activities in ClassroomWiki that pull information from his or her groups Wiki and do not result in a change in the contents of that Wiki.
3. Interactiona students interactions with his or her group members while collaborating,
4. Survey responsea students responses to the various surveys or questionnaires posted by the teacher.

D. ***Group Formation Module***

Heterogeneity principle: The group formation algorithm should balance heterogeneity of learner expertise in a group in such a way that they are less likely to give rise to situations where the participating learners would be demotivated due to too high or too low incongruity between their expertise and the Wiki artifacts they are working on.

E. ***Content relevancy predictor system (CRP)***

In propose one more module in ClassroomWiki– Collabora-tive learning tool along with content relevancy predictor sys-tem as: content relevancy predictor system (CRP). This CRP module compares the assignments submitted by students on specific topic. Teacher has created searching keywords list for particular topic. It compares the submitted assignments with contents of matching list. It arranges the assignment depending on this prediction system.This CRP module compares the assignments submitted by students on specific topic. Teacher has created searching keywords list for particular topic. It compares the submitted assignments with contents of matching list. It arranges the assignment depending on this prediction system. This system helps to find out most accurate and most relevant, useful assignment submitted by student. Hence rest of all students gets access to that relevant topic easily, instead of reading all of them they can refer to most relevant topic using this module.

1) CRP (Content relevancy predictor) Framework: CRP framework include possible Relevancy Predicator keyword list. For particular topic administrator creates possible search words. When student submit topic administrator creates dis-tinct keywords list and common keywords list. Common key words list contains common keywords such as and, the, or etc. It ignores common keywords list and focuses on distinct keyword list. Administrators assign weight for each predicator keyword ranging between 0 to 1. 0 is least important and 1 is most important. It compares distinct keywords with predicator keywords. If match found in predicator keyword for each distinct keyword, it assign weight associated with predictor keyword (between 0 to 1). It there is no match for distinct keyword in predicator keyword list assign weight 0 for those distinct keywords. Then adding weight associated with each distinct keyword and using Content Relevancy predicator for-mula we can find out relevancy of those submitted document.

2) CRP Environment: For each Relevancy predicator key-word RPk such that RPk= RPk1, RPk2,RPkn list of Relevancy Predicator Keyword. Administrator assigns unique weight with each keyword from relevancy predictor array such that RPkw= RPkw1, RPkw2,.., RPkwn 0 ¡ RPKnw ¡ 1 i.e. weight must be in between 0 and 1

For each Distinct keywords Dk such that Dk=Dk1,Dk2,Dkni.e. list of distinct keyword. DkN is total number of distinct keywords in list.

V. MATHEMATICAL MODEL

In this section we represent the working functionality of Classroom wiki model with state transition model

M = nQ; ; @; q0; F o X
Q = f1; 2; 3; 4g
X = f0; 1g
Q0 = f1g
F = 4

Where M is a machine, Q is finite set of states, X is finite set of input alphabets in 0 means sleep and 1 F
@ is transition function which is denoted in transition table.

In this mathematical model we define 4 states, 1,2,3 and 4 Where 1 represents start, 2 represents display, 3 represents confirm, 4 represents final acceptance. This transition diagram explains that how the system works. Whenever any assignment submitted by student it get reviewed by admin. If any changes need to be done it sent back to students. if it approved then sent to final acceptance. Following state transition diagram will explain the working of classroomwiki model.

Below table will explain how the state digram will work. The flow of state transition can be explain by using this table. Whenever any document updated by student it has two state either accept or reject for further revision. Once it was accepted sent to final state. If rejected then student will again submit the assignment.

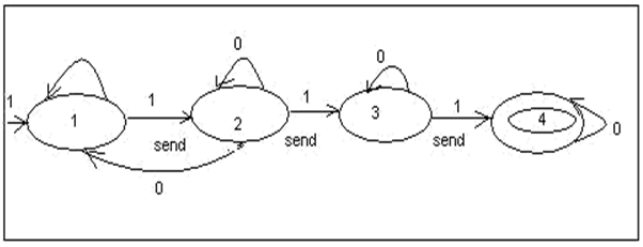


Fig. 1. State transition diagram

Q	0	1
1	1	2
2	2	3,1
3	3	4
4	--	--

Fig. 2. State transition table

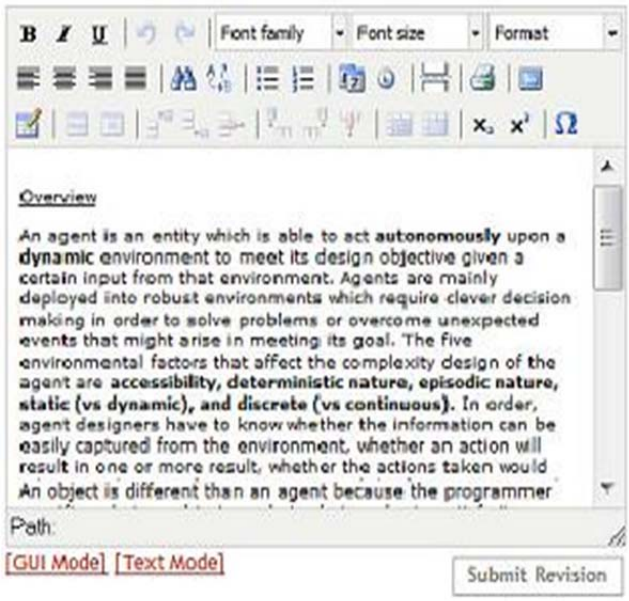
VI. RESULT SET

A. CRP Module

As discussed earlier we get the relevancy of document as per the relevancy predicator keyword list. We can divide the generated output as varying range between 0 to 1. Following is expected result set of Content Relevancy Predictor module. Here Pval is prediction value.

Pval	Relevancy
0-0.1	Not Relevant
0.2-0.5	Least Relevant
0.6-0.8	Average Relevant
0.9-1.0	Most Relevant

B. Wiki Module



VII. CONCLUSION

We have presented ClassroomWiki, designed based on the educational research on modelling the collaborative learning process, to improve typical Wikis functionalities in two as-pects: 1) individual student contributions and 2) group for-mation. While typical Wikis track the changes made by the users, such tracking is from the perspective of the essay, and thus, student-centric statistics are not computed and presented readily, making assessment based on contributions difficult. Furthermore, typical Wikis do not provide functionalities to automatically form student groups for collaborative activities. Our ClassroomWiki provides a multiagent-based group for-mation mechanism that uses the tracked student information to form heterogeneous student groups to improve the collabora-tive learning outcomes of the students. We have reported on a three week- long collaborative Wiki assignment in a university level history course. Although not all results were statistically significant, our analysis suggests that ClassroomWiki may 1) improve the collaborative learning outcome of the students by its group formation framework, 2) help the teacher identify and penalize free riding students, and 3) facilitate specific and precise teacher interventions based on the tracked student activities.

FUTURE WORK

Further investigations are necessary to better understand the impact of ClassroomWiki on the collaborative learning outcomes of the students, and our future work thus involves the following:

i) Investigate the impact of MHCF on student performance when MHCF is able to utilize the student model built on a more detailed history of student activities, and

ii) ii) Collect more data to obtain results with higher statistical significance, and to further evaluate the impact of the three design principles.

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