**Deliverable 3**

**Automated Guidance: Nikunj Dixit**

Automated Guidance is a feature where the community itself offers guidance to group discussions or assignments where it is clear that the group in question is falling behind or failing to understand the important concepts. An example of this could be if a group discussion hasn’t had many posts, then the automated guidance feature pops off relevant ideas that the students can think about, which can stimulate the discussion and get a conversation going among the students. The guidance would be based on the nature of the discussion/assignment. The feature could spit out questions which the students could think about or key words that are relevant to the direction the discussion is intended towards. An example of situation concerning this feature would be if a discussion is about key principles that improve motivation in OLC’s and there aren’t many responses, then the feature may throw out questions like “Think about OLC’s you are part of and what motivates you to participate.” Also key words like “Community design and topic”. These sort of guiding questions/key words could get a student to start thinking about the reasons why they are motivated to participate in OLC’s and the factors like the design of a community and the topics on the community that encourage them to participate. This way the feature acts as a guider, not as a fellow student, but almost like a computer based facilitator for the discussion.

The reason this feature is useful as it provides a helper of sorts for the students if they are stuck in their tasks. When there are multiple discussions and groups, it is difficult for a single instructor to manually go around helping students with their specific problem. The idea of an automated guidance system gives immediate support to the students without the need for manual guidance from the instructor. This ends up saving time for the students as they are getting timely assistance. According to Amy L. Soller’s paper “Supporting Social Interaction in an Intelligent Collaborative Learning System”, an important aspect of improving collaborative learning is to make sure student gets timely help which is what the feature does [1]. What the automated guidance does most effectively is that it improves the collaboration between the students. Its main purpose is to make sure that students in group discussions are given the right direction and ideas regarding the topic of discussion. The support is meant at groups which are struggling with their collaborative discussions and the support comes in the form of the key questions or keywords which would help the struggling students understand what aspects of the topic they can discuss about. This in turn gets them to discuss these new ideas which increases and improves their collaboration in the online community.

There are two key aspects to the feature which make it so useful. The first aspect is that the feature is automated, and therefore does not need any manual input. The main input that the feature would get is the content of the group discussion/assignment which is used to assess whether guidance is required or not. The other main aspect of the feature is the actual guidance. The format of the guidance is through questions or key phrases or statement. The guidance is not intended to tell the students directly what they should be doing. The guidance is meant to point the students in the correct direction. These two aspects put together form an effective guiding system for students which allow them to better collaborate in discussions where they might be struggling in.

[1] Soller, Amy L. "Supporting Social Interaction in an Intelligent Collaborative Learning System."*International Journal of Artificial Intelligence in Education* 12 (2001): n. pag.*Department of Software and Information Systems*. Web. 9 Nov. 2013.

**Autonomous Extra Credit: Sagar Karri**

The basic idea of this personalization feature is to automatically award extra credits to the students who perform well in the discussions. Some factors which are likely to fetch an extra credit are:

-> Giving relevant and good inputs/responses to the posts which help resolving the question.

-> Taking an initiative in discussion posts.

-> Coming up with new discussions which are open and has a wide scope of discussion.

The system tracks and make a list of all the contributions by the users. Whenever the system identifies any comment/reference as valuable, it awards an extra credit to the student. Similarly if a user starts a discussion about a particular topic and there are many people who participate in that with great enthusiasm, then the system identifies it as a good post and awards a credit to the user. Also, if there is any discussion which is not resolved and none commented on that earlier, the user who initiates it will get an extra credit. Apart from these, there can be other factors as well which might be taken into consideration to award the credit. The system make use of the concepts in artificial intelligence in order to identify these factors.

And coming to how giving extra credits benefits the user, Giving an extra credit always helps improve the confidence as well as recognition to the efforts of the student. Say for suppose we have a system where points are generated basing on the number of contributions in discussion posts. There might be people who give relevant points and keep the discussion live while others may give irrelevant examples and comments which makes no sense. In a system which awards points only basing on the number of contributions, the first set of people are no different from the later which is not fair. So, if you differentiate them from the others, the efforts of the students will be paid off. Also, if you can award points for extra efforts, students tend to put in more efforts. Else there might be a point where a student gets vexed up as there is no difference shown between the one contributing better than others. The other students who don't get an extra credit also tries working hard to achieve the extra credit. In either ways this feature helps the students.

The extra credit can also be given to a person who do interestingly well in the course or by taking up additional tasks/ quizzes.

Reference:

Michael Streich, Extra credits can help all students improve, oct 2013

**Skill-based formation of groups: Sai Baskaran**

**Description**

In a learning environment, it is beneficial that groups are formed with a good mix of the different skills required for doing the project. For example, consider a project that requires building an online learning community. An ideal group composition for such a project would be to have a good mix of students with expertise in web development, database management, data mining and software testing. Such a group would enable social learning as well as collaboration [1].

**Implementation**

This involves four phases:

1. The system first understands what the required skill sets are for a particular project. This can be done by searching through the description for key words and matching key words against a list of pre-defined skillsets in the domain.
2. Next the system has to identify the people who have been actively contributing in such skill-set domains. Hence this defines the adaptive behavior of the system. The system constantly tracks the user’s contributions in various forums and maintains a history of skill sets that were acquired by the user. This can be learned by first defining some models of ideal student behavior for various skill sets and then using a machine learning algorithm to detect the amount of skills that have been gained.
3. The system now assigns the groups such that there is a mix of the different types of skills that are required for the project.
4. After the assignment, the system updates the skills table for each user based on his performances in the project.

**Benefits**

1. Groups are composed of mixture of people with different skill sets. Hence this allows for collaborative learning due to the influence of different perspectives that are brought in by different members.
2. Due to the fact that people’s skills are constantly changing, the system adapts to this when forming groups. Hence it would be very likely that students are put into different groups for different projects, rather than being put in the same project every time. This enables learning by having to constantly work out of the comfort zone.
3. Feature allows a good competition amongst groups for the project, since each group would contain a good balance of the different skills.

**Citations**

[1] Asma Ounnas, Hugh C Davis and David E Millard, “A Framework for Semantic Group Formation in Education”, Educational Technology & Society, 12 (4), 43–55.

**Autonomous Topic-based research/opportunity suggester: Udai Arora**

While going through a thread, a student might want to learn more about a particular topic being discussed in the thread. He may also want to *search* for the job opportunities in a related domain.

The aim of this feature is to notify users about the research going on in the topics related to the current thread. It will also suggest articles relevant to the topics discussed in the thread. These suggestions would be topic-specific rather than thread-specific as a thread can be related to multiple topics. The feature will also pull out job opportunities in areas related to the topics being discussed in the thread. Depending upon the number of references of a topic in a thread, the frequency of suggestions will vary proportionately with it. As we see, the social discussions are dynamically altering the suggestions made by the feature, which is leading to learning by providing users with not only the motivation (Job/Research opportunities), but also the resources which leads to this learning (Articles, Research Papers, etc)

For example, assume that a user is browsing a thread titled “Having trouble with setting up the AWS based cloud infrastructure” and a user replies to this thread saying “Look into using some Software as a Service (SaaS) rather than setting it up yourself”. Now if a user is browsing the thread, he will receive notifications related to SaaS like- “Suggested Readings:<http://www.wired.com/how-saas-is-the-future.html>”, “Job Opportunities: Required Google App Engine Engineer at Groupon.com. To apply click here<http://www.gropon.com/jobs/saas.html>”, “Research Opportunities: SaaS- 80%”.

Now suppose another user posts a reply to the same thread- “I think you should look into calling AWS. They were pretty helpful in my case”. Any user who visits the same thread now, will get the above notifications plus new notifications like: “Suggested Reading: Jackson, Keith R., et al. "Performance analysis of high performance computing applications on the amazon web services cloud." *Cloud Computing Technology and Science (CloudCom), 2010 IEEE Second International Conference on*. IEEE, 2010.”, “Job Opportunities: Amazon Web Cloud Engineer at Hewlett-Packard”, etc.

This feature extract topics in a thread using natural language processing and artificial intelligence. Hence the social discussions in a thread will dynamically provide the suggestions for Job and Research Opportunities- thereby motivating the user to learn. Learning is achieved by suggesting resources related to a topic, again using social discussions happening in that thread. Eventually this will support social learning.

References:

[1] Akers, Ronald L. "Deviant behavior: A social learning approach." (1977)

[2] Wegerif, Rupert. "The social dimension of asynchronous learning networks."*Journal of asynchronous learning networks* 2.1 (1998): 34-49

**The way features complement each other:**

The various individual features complement each other in different ways. However they all contribute to fulfilling the need of getting group members to interact with each other more effectively. Firstly, the groups are formed based on their skill set with the aim of of having group members that would work well together and meet the requirements of the task the group is assigned to.The autonomous extra credits would be awarded to the members who participated well and gave good inputs in the group discussions. This encourages the students in the group to interact better with each other regardless of what skill they have and share their skills with the other students in the group. Also, when discussions are going on within a particular group, it is likely that the group members would get stuck at some point or another. This is when the Automated Guidance come into picture where system generate hints to keep the discussion active. Meanwhile, when the discussion is on going, the system identifies the domain and suggest relevant research and opportunities which will be useful for the participants if they are planning to work deep in that domain. The suggestion of the relevant research and opportunities also helps the students within the group because the knowledge generated by the references would help further the discussion and increase their knowledge.