Collaboration strategies within open source e-learning systems:

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Implementation of essential content-free collaboration methods within LAMS

A number of content-free collaboration methods were implemented within LAMS using some of its essential tools (http://wiki.lamsfoundation.org/display/ lamsdocs/Home). These tools are demonstrated in its interface (Figure, 1) and briefly presented below:

- The *Assessment tool* that allows sequence authors to create a series of questions with a high degree of flexibility in total weighting

- The *Chat Activity* runs a live (synchronous) discussion for learners

- The *Chat and Scribe Activity* combines a *Chat* Activity with a *Scribe Activity* for collating the chat group's views on questions posed by the teacher

- The *Forum Activity* provides an asynchronous discussion environment for learners, with discussion threads initially created by the teacher

- The *Forum and Scribe Activity* combines a *Forum* Activity with a *Scribe Activity* for collating Forum Postings into a written report

- The *Mindmap activity* allows teachers and learners to create, edit and view mindmaps in the LAMS environment. Mindmaps allow for the organising of concepts and ideas, and exploring how these interact

- The *Multiple Choice* activity allows teachers to create simple automated assessment questions, including multiple choice and true/false questions

- The *Notebook Activity* is a tool for learners to record their thoughts during a sequence of activities

- The *Noticeboard Activity* provides a simple way of providing learners with information and content. The activity can display text, images, links and other HTML content.

- The *Question and Answer Activity* allows teachers to pose a question or questions to learners individually, and after they have entered their response, to see the responses of all their peers presented on a single answer screen

- The *Share Resources tool* allows teachers to add content into a sequence, such as URL hyperlinks, zipped websites, individual files and even complete learning objects

- The *Submit Files Activity* allows learners to submit one or more files to the LAMS server for review by a teacher

- The *Survey Tool* presents learners with a number of questions and collects their responses. However, unlike Multiple Choice, there are no right or wrong answers

- The *Wiki Tool* allows authors to create content pages that can link to each other and, optionally, allow learners to make collaborative edits to the content provided.
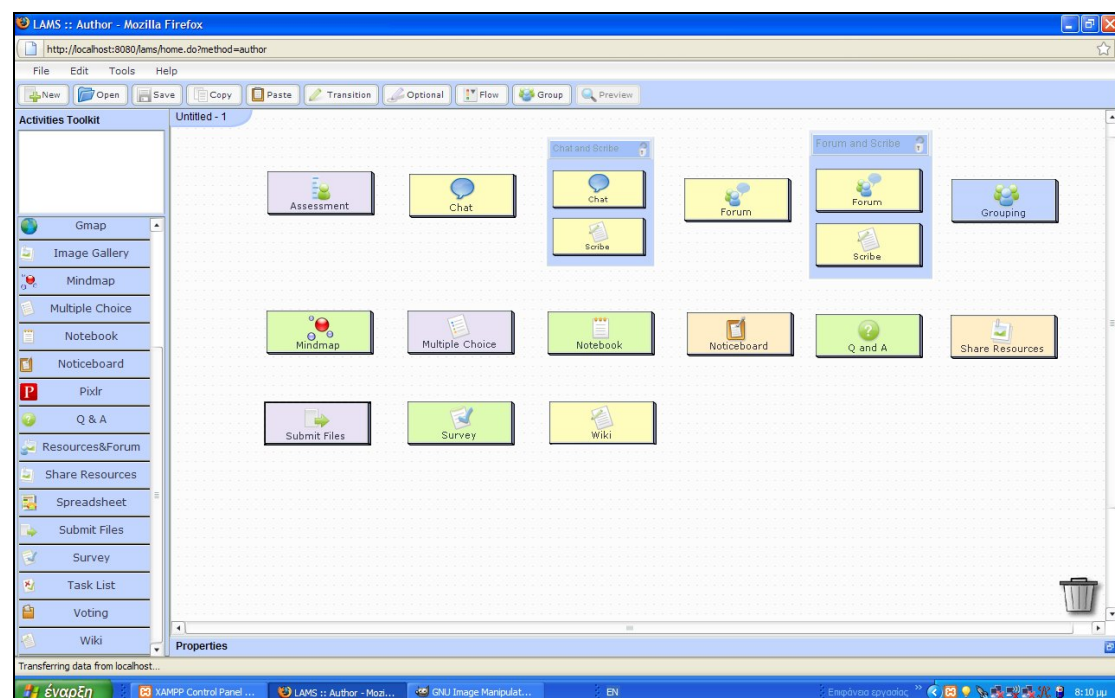
Figure 1. Tools for learning design presented on the interface of LAMS

In the next section of this chapter, the set of collaborative methods referred to in the previous section (Section, 3), are briefly presented in combination with their implementation as collaborative design patterns using the previously mentioned tools of LAMS. Specifically, each method is presented in terms of: (a) a short introduction and general information (b) its' goals (c) description of its processes in terms of appropriate steps to be performed (d) its diagrammatic implementation as a design pattern within LAMS. The presentation of these patterns is referred to the context of synchronous collaboration. However, these patterns could be used also for asynchronous collaboration by substituting the function of "Chat and Scribe" by the "Forum and Scribe" function.

5.1. Brainstorming

Brainstorming (Osborn, 1963) is a group management technique designed to promote the generation of a large number of ideas for the solution of a problem. The main goal of the technique is to encourage group members to adopt a more liberal approach in the expression of personal opinions.

Goals: 1) to facilitate quick generation of ideas, 2) to encourage creativity and indirect thinking, 3) to involve all the team, 4) to underline the importance of collaborative study.

Process: 1) Generation of ideas and writing of same, 2) Commenting on ideas, 3) Asking for criteria for idea categorisation and 4) Presentation of the main ideas.

A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 2.
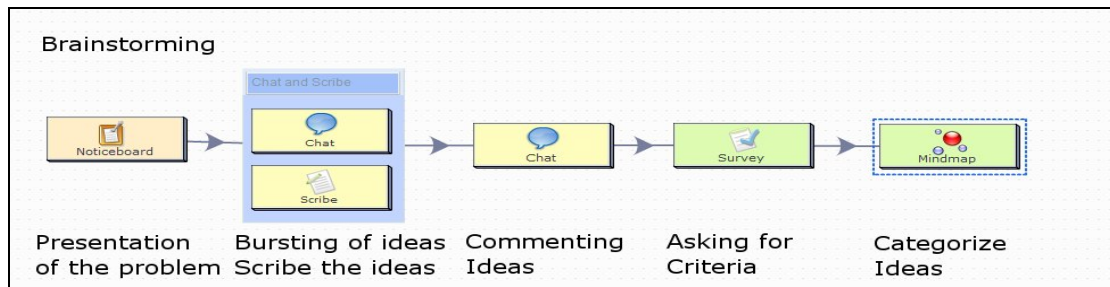
Figure 2. Implementation of *Brainstorming* as a design pattern within LAMS

5.2. Student – Teams – Achievement - Divisions (STAD)

STAD (Slavin, 1978) is considered to be one of the basic approaches to introduce learners to cooperative learning. The use of this method is thought of as an effective and efficient way to teach well defined educational subjects. The teams are heterogeneous, made up of learners of diverse academic achievement, race, and nationality. The reward of the best teams motivates better students to encourage the other members of team in order to achieve the mutual goal.

*Goals***:** 1) to motivate students to encourage and help each other, 2) to accelerate student achievement, 3) to facilitate gains in self esteem, liking of class, 4) to improve behaviour.

Process: 1) Personal assessment, 2) Assignment presentations, 3) Team collaboration, 4) Collaborative writing of reports, 5) Team assessment, 6) Praise for best reports.

A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 3.
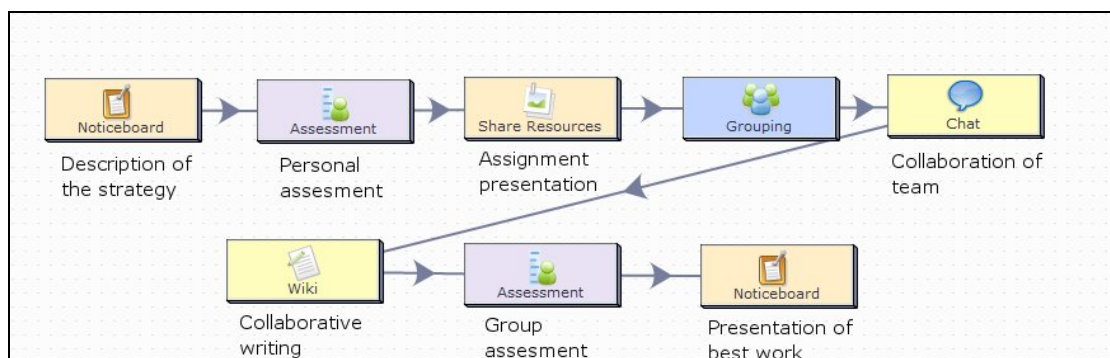

Figure 3. Implementation of *STAD* as a design pattern within LAMS

5.3. Jigsaw

The *Jigsaw* method (Aronson, E., Blaney, N., Sikes, J., Stephan, G., & Snapp, M. 1978) is a cooperative learning strategy which enhances the process of listening; commitment to the team; interdependence and team work. Each member of the team has to excel in a well defined subpart of the educational material undertaking the role of expert. The experts form a different group discussing the nuances of the subject and later they return to their teams to teach their colleagues. The ideal size of teams is 4 to 6 members.

Goals: 1) to build interpersonal and interactive skills, 2) to ensure that learning revolves around interaction with peers, 3) to hold students accountable among their peers, 4) to encourage active student participation in the learning process.

Process: 1) Divide the problem into sub-problems, 2) Assign roles and material to each student, 3) Form group of experts, 4) Experts study the material and plan how to teach their colleagues, 5) Create heterogeneous groups, 6) Experts teach in their groups, 7) Assess students.

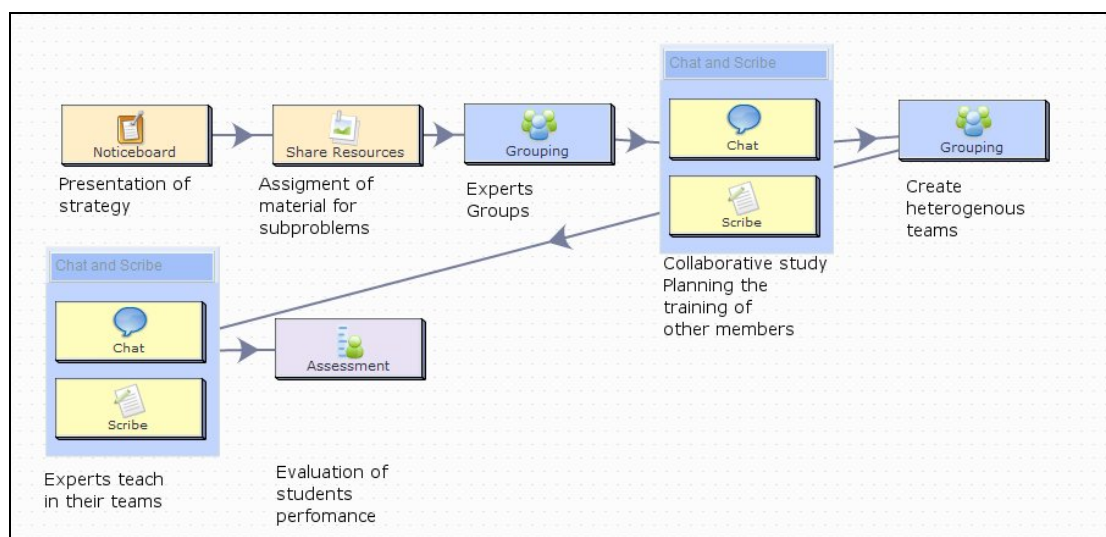A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 4.

Figure 4. implementation of *Jigsaw* as a design pattern within LAMS

5.4. Group Investigation Method

This method was proposed by Sharan and Hertz-Lazarowitz, (1980). It is based on the four

main elements of learning process: 1) Investigation, 2) Interaction, 3) Interpretation, 4)

Intrinsic motivation. During the operation of this method, groups work on similar problems

using versatile approaches. The whole process leads to the active construction of knowledge.

Goals: 1) to organise the class, 2) to design activities promoting versatile approaches, 3) to

promote plural discussion on learning material, 4) to enrich teacher-student interaction.

Process: 1) Teacher sets the problems to be studied, 2) Teacher shares educational materials,

3) Groups analyse the given problem in sub-problems, 4) Each member of the group studies a

specific sub-problem, 5) Teacher provides additional material, 6) Discussion and drawing of

conclusions, 7) Collaborative writing of reports, 8) Assessment and enhancement of reports in

discussion with teacher, 8) Presentation of the main ideas, 9) Final interaction between

students, 10) Assessment.

A diagrammatic representation of this method –as a design pattern within LAMS- is presented
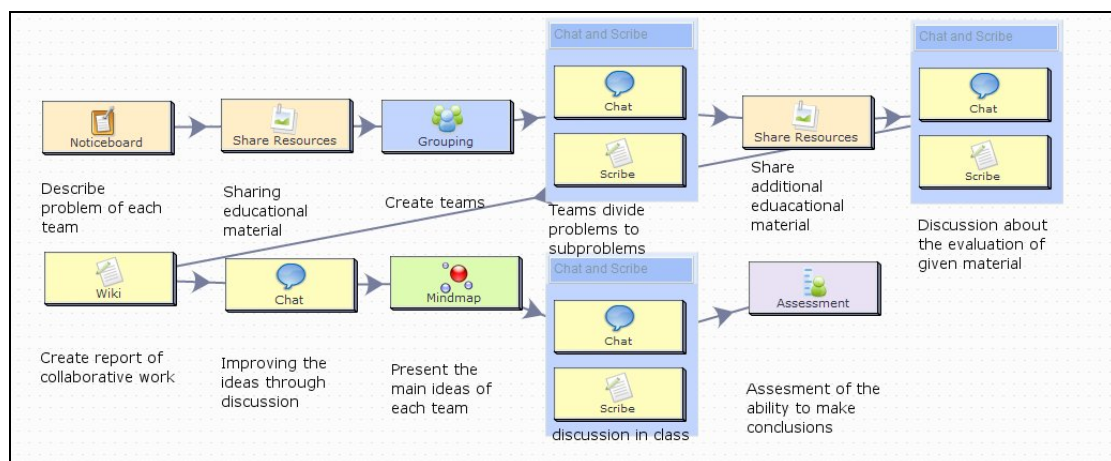
in Figure 5.

Figure 5. Implementation of the *Group Investigation* method as a design pattern within

LAMS

5.5. Co-op, Co –op Method

This method was proposed by Kagan (1985). It belongs to the category of methods focusing

on the development of group consciousness inside class (class building techniques). The

learner undertakes the responsibility to control what and how he learns. There is a little interaction among the teams.

Goals: Similar to the previous structure. The main aim is to cultivate the ability of students to approach problems with different structures.

Process: 1) Division of the problem into team sub-problems, and later into student sub-problems, 2) Sharing of the educational material, 3) Each student prepares his subject, discussing it in class in order to collect more info, 4) Creation of groups, 5) Each student presents their report to their group, 6) Discussion of the connection of the sub-subject to the whole, 7) Preparation of the team report, 8) Presentation in class of group reports.

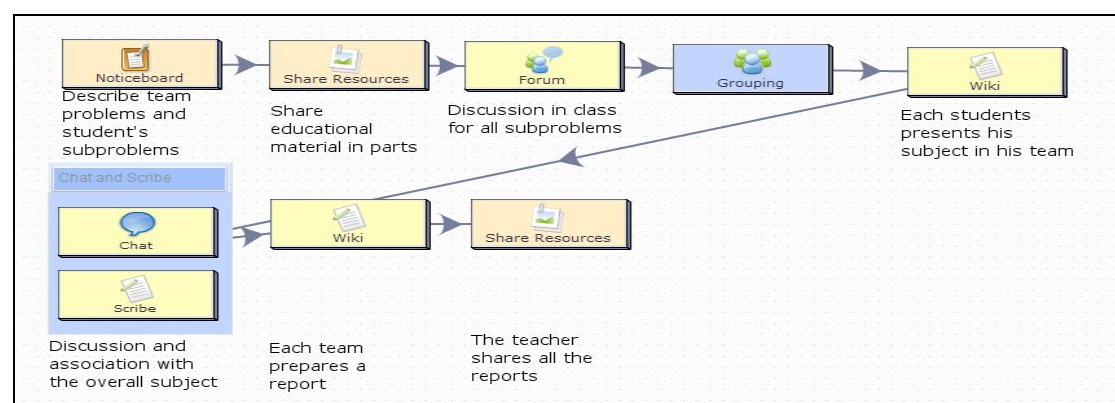A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 6.

Figure 6. Implementation of *Co-op, Co–op* as a design pattern within LAMS

5.6. Guided Reciprocal Peer Questioning

The method of *Guided Reciprocal Questioning* guides learners how to assess their understanding when studying (Palincsar, and Brown, 1984; Martin & Blanc, 1984. This method is based on questions influenced by the well known Bloom taxonomy. Specifically, this method allows learners to identify the question patterns of their teacher, and to recognize more easily the important ideas to be learned.

Goals: 1) to encourage Critical Thinking, 2) to make the student understand what information is important, 3) to help in the introduction of previously unknown material, 4) to stimulate discussion on specific subject.

Process: 1) Present the problem, 2) Study the material for 10-15 minutes, 3) Teacher shares a set of semi-completed questions, 4) Each student prepares the answers to questions and submits them to the teacher, 5) Discussion on the subject, 6) Assessment based on the given questions.

A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 7.
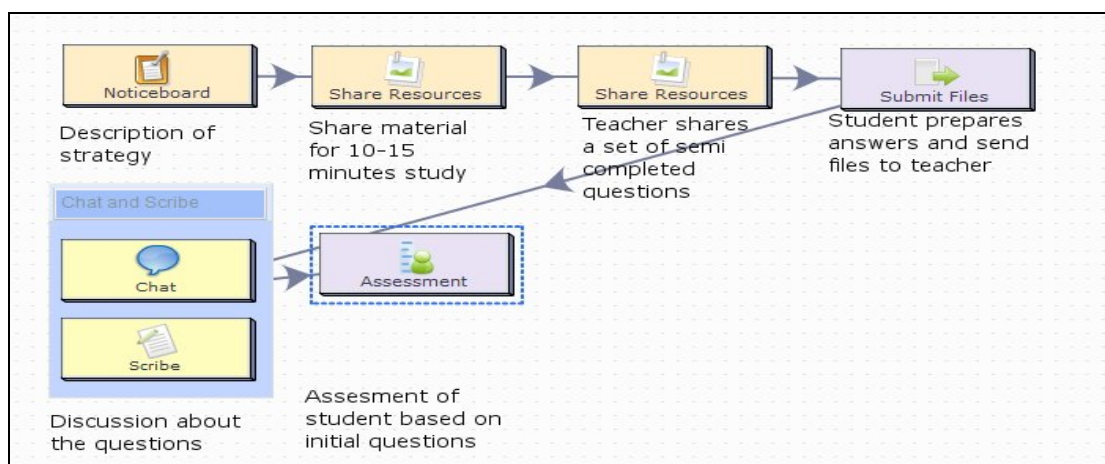

Figure 7. Implementation of the method of Guided *Reciprocal Questioning* as a design pattern within LAMS

5.7. Three Step Interview

The *Three Step Interview* (Kagan, 1994) can be used as a tool to support the better comprehension of ideas through discussion with peers. Each learner listens to others' opinions, enriching their cognition about the specific topic. Even the weaker learners with little prior knowledge will gain a better understanding of the subject because of the participation in the interviews.

Goals: 1) Team building, 2) Reinforcement of the comprehension of information based on lectures or textbooks, 3) Engagement of students in conversation.

Process: 1) Sharing of material, 2) Assignment of the roles of the interviewer and interviewee, 3) Formation of a team, 4) Timed discussion and inversion of roles, 5) Formation of groups with 4 members, 6) Discussion between pairs.

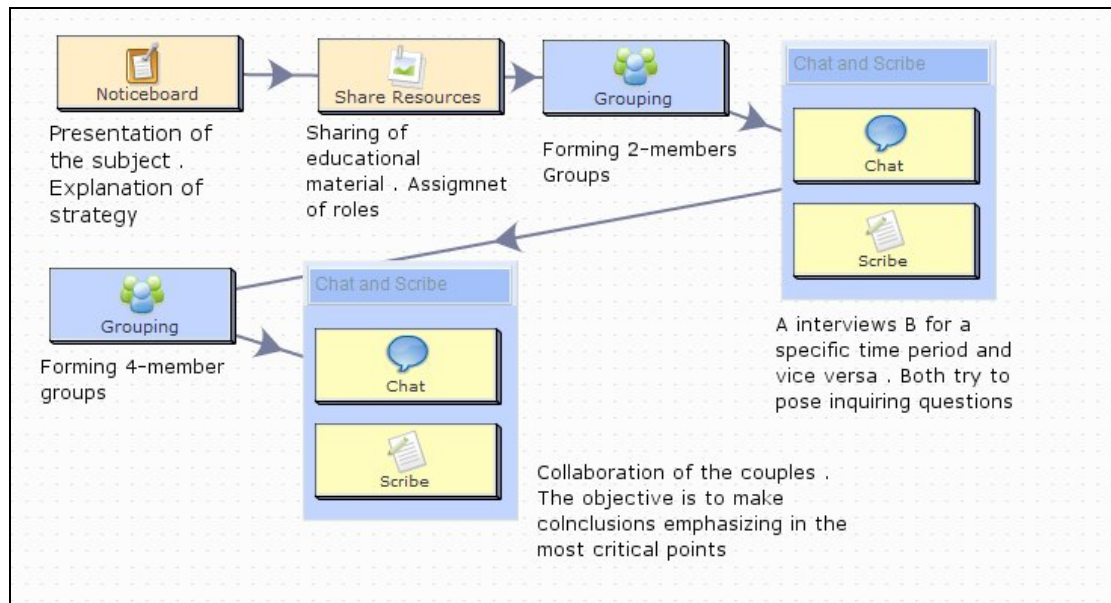A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 8.

Figure 8. Implementation of the method of *Three Step Interview* as a design pattern within LAMS

5.8. Paired Annotations

Millis and Cottel (1998) suggest this method as capable of improving the ability of learners to comprehend faster. The main idea is the formation of student pairs who try to identify key ideas. The frequent alternation of the pairs may help the further development of metacognitive skills.

Goals: 1) to enable students to identify key points, 2) to develop literature review skills, 3) to encourage students to make connections between new and existing bodies of language, 4) to promote cooperative learning through accountability and positive interdependence.

Process: 1) Sharing of the educational material, 2) Grouping in pairs, 3) Discussion about key points, 4) Grouping in teams of 4 members, 5) Further discussion within the bigger groups about the key points, 6) Collaborative writing of summary of the learning material.

A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 9.
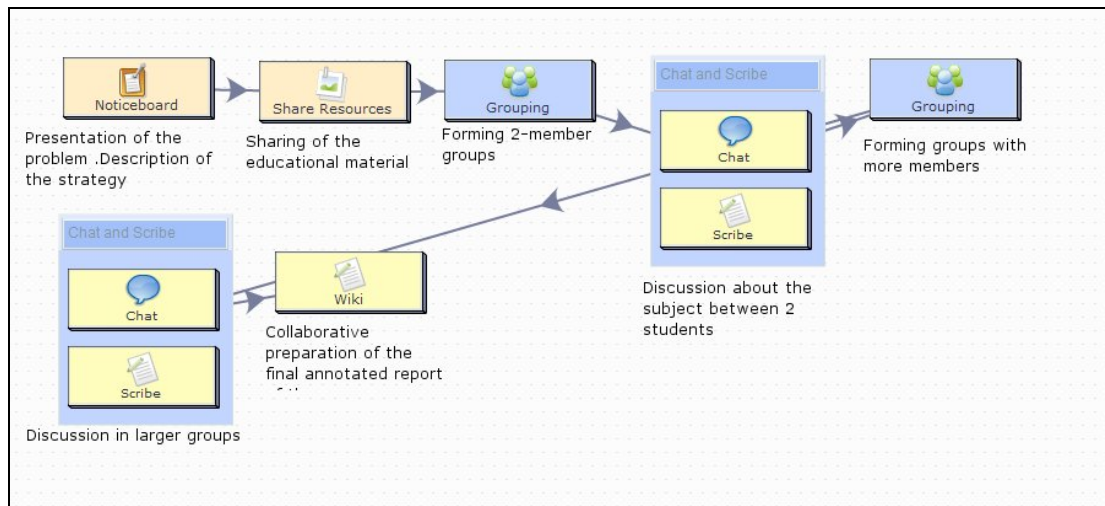
Figure 9. Implementation of *Paired Annotations* as a design pattern within LAMS

5.9. Double Entry Journal

This method (Berthoff, 1981), belongs to the category of reflective techniques. The learner has to play two different roles: a) The role of researcher, who collects information and builds knowledge, and b) the role of reviewer, who compares his findings with the established wisdom. All these roles are realized in an environment of collaborative learning.

Goals: 1) to help students focus on key points, 2) to provide an alternative method of study, 3) for students to become more involved with the material they study, 4) to improve students' comprehension and vocabulary.

Process: 1) Sharing of educational material, 2) Grouping in teams, 3) Discussion about the given subject and research for additional material, 4) Sharing of more specialised material, 5) Teams compare their findings with the new material, 6) Conclusions are discussed in class, 7) Presentation of the main ideas and conclusions.

A diagrammatic representation of this method –as a design pattern within LAMS- is presented in Figure 10.
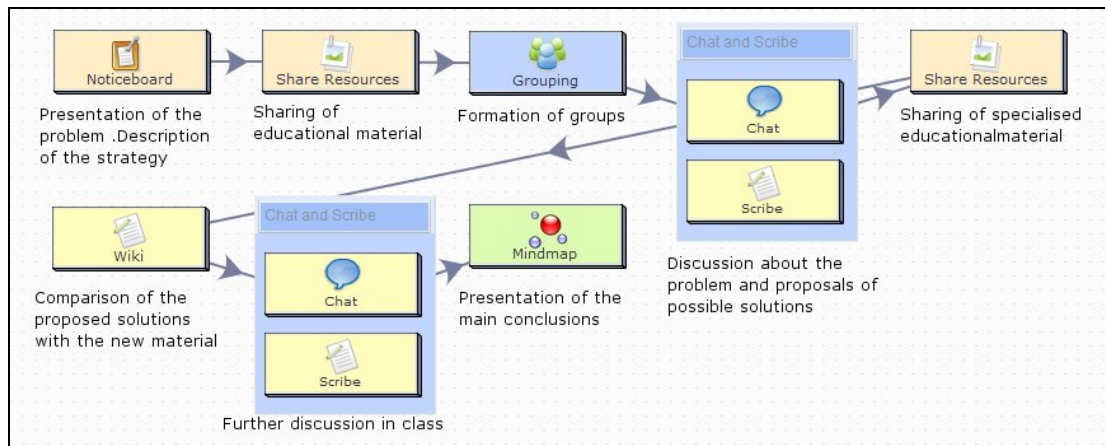
Figure 10. Implementation of *Double Entry Journal* as a design pattern within LAMS

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