Knowledge Management for Teaching and Learning: an Example in Computer Science Education (Poster)

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Abstract

The main requirement for knowledge management (KM) of teaching and learning based on the use of project-based collaborative learning model is to stimulate collective knowledge building (Stahl G., 2006; Scardamalia M., Bereiter C., 2003; Weinberger A., Reiserer M., Ertl B., Fischer F. & Mandl H., 2003). Knowledge building is a process of creation of professional intellect (Lopez A. M. , Donlon J. J., 2001). Professional intellect is created by the four levels of knowledge: know-what, know-how, know-why, care-why (Tiwana Amrit, 1999).

The purpose of this research is to present KM approach to project-based collaborative learning. The approach suggests dynamic formation of a special learning environment for every study project. The learning environment contains: groups of project tasks formed in a certain way, together with the schedule of their completion; a specific scheme of assigning collaborative groups of students to perform their tasks. The tasks in each task group have maximal diversity relative to task-relevant knowledge. Assigning students of a collaborative learning group to perform their tasks should be done based on the following condition: knowledge of a student must differ as much as possible from the task-relevant knowledge. It creates lack personal knowledge and initiates the maximal need of a student for knowledge necessary to complete the task. As a result, transfer of knowledge components from one student to another in a group is facilitated to the maximum. Knowledge components are transferred between students during collaboration while performing project tasks. A knowledge component comprises sub-components. The sub-components characterize knowledge levels. Every sub-component has weight. Weight characterizes importance of a sub-component. Weights of sub-components are set according to the specificity of a course. Evaluation of quality of collaboration is performed by taking into account the knowledge sub-components acquired by students as a result of collaborative project work. The approach is described in a detailed example.

The proposed approach provides:
- Facilitation of transfer of knowledge among the students of a collaborative group by means of maximal mutual supplementation of student knowledge
- Schedule of completion of project tasks by students of a collaborative group
- Management of collaboration
- Evaluation of the results of collaborative learning during project work and the study of a subject by each student
- Control, measurement and assessment of student knowledge

- High effectiveness of teaching and learning processes

The future research will be directed to development of a computer support tool for KM during teaching and learning.

Keywords: knowledge management, project-based collaborative learning.

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