COALE: Collaborative and Adaptive Learning Environment

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ABSTRACT

This paper proposes a new adaptive WBT (Web Based Training) environment for collaborative learning named COALE (Collaborative and Adaptive Learning Environment). COALE is an integrated environment of collaborative learning into individual learning based on WBT with active personalized awareness provider. We propose a personalized active recommendation system, which gives proper awareness at proper timing for each learner to support dynamic course organization aimed at effective and efficient learning.

Keywords

Collaborative learning, personalization, recommendation, awareness.

INTRODUCTION

This paper proposes a WBT (Web Based Training) system with active personalized awareness provider, named COALE (Collaborative Adaptive Learning Environment), to support dynamic course organization aimed at effective and efficient learning. COALE is based on the learner-centered concept. So the learners take the initiative of their own process of learning with proper supports from the environment, instead of given the next step from the system automatically through the intention of an author of the course. COALE has two keywords in its name: adaptive and collaborative. Adaptive features are realized by personalization. COALE supports learners' to select the next step learning material by personalized recommendation. The next step material selections settle the main road of the Course, step by step. COALE provides collaborative learning support to learners': to post shared knowledge and to discuss with co-learners. Note that we consider the posted shared knowledge as a part of the learning materials. Discussions and advices works to spread and deepen the learners' knowledge, therefore collaboration is considered to spread the width of the main road or to form branch roads of the Course.

COALE

Personalization is popular technique of web customization or e-commerce where user interface or contents recommendation is personalized according to the users' former activities (Hirsh, 2000). The major difference between such systems and COALE is the filtering criteria for the recommendation. The way of presentation of awareness information called the intervention type (Jermann, 2001) is "graphical visualization" and the level is monitoring among the three levels: mirroring, monitoring, and advising. This approach is similar to SharlokII (Ogata, 2000).

User Interface

Fig. 1 shows a display snapshot of the COALE prototype system.

Main Window (A): The right side window is the main place for individual learning action. A learner read and solves an exercise question, put an answer. The system checks the answer whether it is correct or not. By pushing the "explanation request" button, the system shows the explanation of the answer. Pushing the "show shared knowledge" button, the system presents a list of the shared knowledge for learners' selection. To put a shared knowledge, push the "knowledge input" button then an window for input will be opened. As for collaborative learning action, "request discussion" button works to open a chat request window for the first step of opening a discussion.

Contents Awareness Map (B): To select the next step exercise, learners select one of the recommended contents from the Contents Awareness Map. On the Map, a square mark represents a category, a circle represents an exercise question, which has not been correctly answered, and a diamond represents a question, which has not been learned. The level of difficulty of a question is reflected on their color. The orders of recommendation are displayed as a number at a side of the question title. The questions, which are graded as first and second, are presented in red text and given the order number. Learners can select a circle or a diamond to open the corresponding exercise question.

Learn*ing-mate Awareness Map(C):* To select a proper partner of discussion, learners can consult the Learning-mate Awareness Map. The nodes represent co-learners, exercise questions, and categories of questions. Corresponding marks are circle, diamond and square. Firstly and secondly recommended learners are in yellow color, presented with the order

number. Moreover, up to two contents for these two recommended learners are displayed as their background knowledge. From third to seventh recommended learners are shown in gray circle.

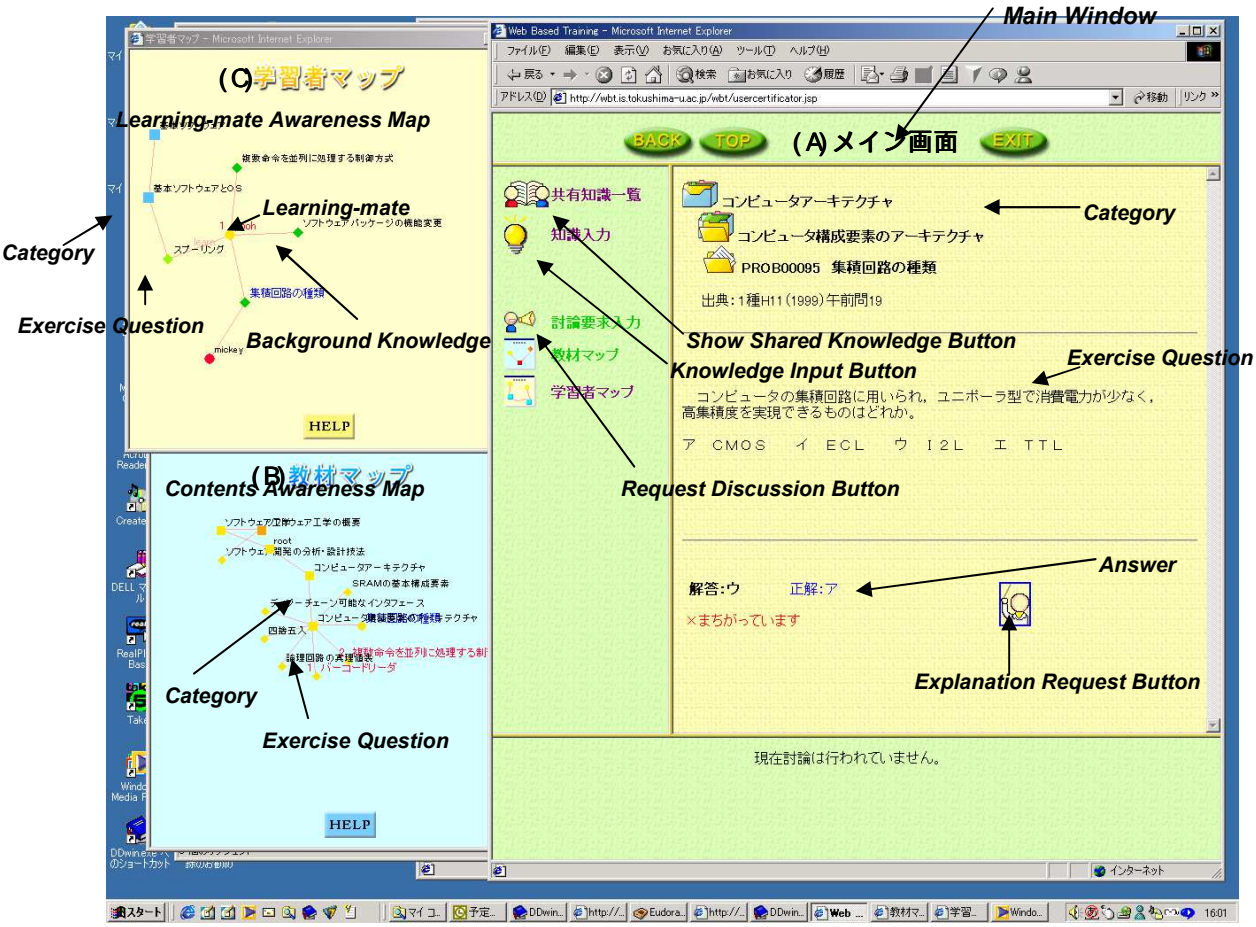

Fig. 1. Screen snapshot of COALE.

CONCLUDING REMARKS

This paper proposed two kinds of personalized active awareness provider. One recommends learning contents for the next step and the other recommends learning-mate for discussion. Both of them are presented as a visualized map using GUI, according to the history and the current state of learners' behavior. Because COALE follows the learner-centered concept, the final decision of selection is left to the learners. This work was supported in cooperation with the Information Technology Consortium, as a part of a project of the Information-technology Promotion Agency Japan.

REFERENCES

Hirsh, H., Basu, C., and Davison, B. D. (2000) Learning to Personalize. *CACM*, **43**, 8, 102-106.

Jermann, P., Soller, A., and Muehlenbrock, M. (2001) From Mirroring to Guiding: A Review of State of the Art Technology for Supporting Collaborative Learning. *Euro-CSCL 2001,* 324-331.

Ogata, H., Matsuura, K., and Yano, Y. (2000) Active Knowledge Awareness Map: Visualizing Learners Activities in a Web Based CSCL Environment. *Proceedings of The International Workshop on New Technologies for Collaborative Learning (NTCL) 2000,* 89-98.