

Development of UCC based learning system for an Efficient Computer Science Education

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Abstract. With The rapid development of computer technology, information and communication has brought many changes to the field of education. Now, in the field of computer education, the new requirement is to increase the students' abilities to solve problems by enabling them to search for and find the answers by themselves, and to encourage the students' initiative to study in a self-directed way. In this paper, an adaptive UCC based learning system is developed and applied to teach the field of computer science in a way which is fun, directs the students' interest, and instructs the students effectively.

Keywords: computer education, software education, UCC based learning

1 Introduction

New information production and existing information re-production is recognized as important goods these days, requiring ceaseless changes in people's daily lives. Now, the ability to acquire and use information communication technologies has become one of the survival strategies beyond those for individual development. In this situation, proper ICT education becomes more and more important. If the goal of education is not only the acquisition of knowledge but also the improvement of problem solving ability in daily lives, the most desirable teaching-learning model may be to put learners in many different situations, let them work to find own solutions and gain lessons in the process [1]. In such problem-solving practices, the key is the process itself and process-centered problem solving practices can help make play become more educational. It is because play is not only a natural part of children's daily lives but also a basic form of learning. By playing, children have diverse experiences for concept formation and generalization and experience cognitive thinking process [2].

2 Related works

According to literature on problem solving study models, it is necessary to develop a more standardized and specialized teaching-learning model while selecting more relevant study themes in classroom teaching and enhancing relevant systems. Also it is necessary to research for an improved problem-solving study model applicable to the classroom environment and beyond [3].

The biggest problem in the studies on play-based learning methods [4] is that children cannot participate in learning by playing in a self-directed manner. It is because of the absence of an appropriate teaching-learning method to help them do so. Therefore, students should be allowed to participate in play in a self-initiated manner and such a teaching-learning method could expand play hours and learning by playing opportunities beyond classrooms into homes, providing diverse learning opportunities for self-initiated pleasant involvement of children.

In order to improve online study effectiveness, many ongoing studies use UCCs [5]. However, such studies using UCCs in study have not clearly explained UCC accessibility-related aspects and a systematic USS-based teaching-learning method. So such a UCC-based method has yet to be easily accessed in the real world. A well-organized teaching-learning model based on UCCs is much need where students can find and choose UCCs easily for their study.

In this modern society entering a ubiquitous period, a problem solving study practice should employ UCCs and learning by playing method in order to maximize self-directed study ability and problem solving ability. With the model in place, students would be able to solve any given problem on their own initiation through plays and UCC materials in a creative way, enhancing self-directed learning ability and problem solving ability.

3 Design of UCC based Learning System

UCC based learning system in this paper is a system to support the teaching-learning model for computer education. It is consisted of processes for individual study and group study, and administrator and learner's module for data management. The figure 1 shows the overall structure of proposed UCC based learning system. The system supports the following roles: first, by using a study question room, it presents study questions to learners online and guides them their study process. Second, by using a UCC data room, it lets students to search UCC data and explore ways of problem solving. Third, it uses a mentor's room to provide mentoring between learners and learners or teachers and learners. Forth, it uses a play room to inform the types and methods of plays for problem solving. Fifth, it employs a play room to make learners discuss and debate each other. Lastly, it provides an assignment submission room for students to turn in their final results of problem-solving efforts. The figure 2 shows the assignment submission room of proposed UCC based learning system.

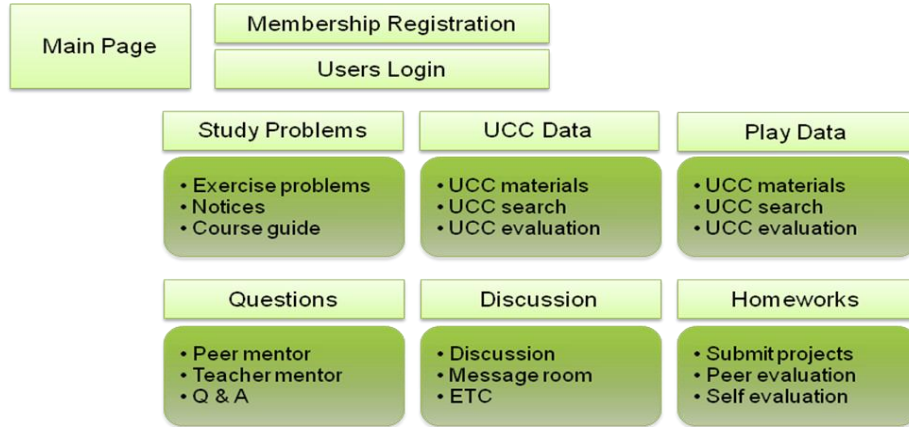


Fig. 1. Structure of UCC based learning system



Fig. 2. Assignment submission room

4 Conclusion

In this paper, the nature of computer education was fully utilized so both online and offline study were allowed in parallel. Also, UCC materials were utilized herein, which account for the most part of the internet environment at the frontline of attracting students' interest in this modern information society along with plays that encourage students' interest and proactive class participation. In order to efficiently implement the UCC based learning system designed, skilled teachers' ICT ability is required along with advanced school and home information facilities. More study will be necessary on play methods applicable to computer science classes.

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