

VISOLE: A New Game-based Situated Learning Paradigm

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Abstract

VISOLE (Virtual Interactive Student-Oriented Learning Environment) is a new Game-based Situated Learning Paradigm for Web-based teaching and learning, which aims to help students learn from near real-life experiences and social constructions of knowledge. In this paper, we discuss the theoretical foundation, education paradigm, and technological implementation of VISOLE.

1. Introduction

Some educators (for example, [1]) argued that WEB-based learning would eventually lead to a paradigm shift of learning style, from teacher-centered to student-centered. We argued that the current practices in WEB-based teaching use the WEB more as a storage and I/O medium, and less as a powerful computing machine [2]. For fully using the power of the Web, a new Game-based Situated Learning Paradigm--VISOLE (Virtual Interactive Student-Oriented Learning Environment) for Web-based teaching and learning was proposed [2]. The paradigm aims to help students learn from (near) real-life experiences and social constructions of knowledge in a gaming environment and with means to prepare them to learn, and to reflect after the game.

In this paper, we will outline the theoretical foundation, education paradigm, and technology implementation of VISOLE.

2. Theoretical Foundation

This session describe the theoretical background of the design of the system.

2.1. Situated Learning

Situated Learning began attracting the scholars' attention in the last years [3]. Scholars subscribed to this paradigm argued that the learner and the environment, the cognition and the activity are often separated in traditional school education context; the schools mainly pay attention to abstract, simplistic and

without environmental knowledge [4]. Most of the knowledge that learners achieved is the inert knowledge mentioned by Whitehead [5], which cannot be easily transferred to the related situation.

Brown and others [4] thought that knowledge is situation-based, that is, it is influenced by, and cannot be separated from the situations and cultures within which knowledge is exerted. Essentially, learning is a process that individuals engage in interactions with other individuals and environments. It is a process of forming practical abilities and promoting social-cultural standards. Among other things, learning is an activity-taking place in certain social environments [6]

2.2. Educational Game

Although some educators worry that the sex and violence in the games will influence the youngsters (e.g., [7]), many educators argue that games can be applied into education (e.g., [8]).

During the last decades, lots of educational games have been developed and used in education. Researches on the effectiveness of games showed that games can arouse students' intrinsic motivation, and improve their basic skills such as eye-hand coordination, problem solving skills, collaborative skills, and other skills (e.g., [9]). In addition, games can facilitate affective learning, active learning, situated learning, and collaborative learning (e.g. [8]).

2.3. Game-based Situated Learning

Computer technology nowadays enables the creation of near real-life virtual worlds, which give players the feeling of living in a real situation and assuming a role in there. They can then communicate, interact and cooperate with others and thus achieve the aim of situated learning.

Based on this idea, Lee and Lee [2] proposed the VISOLE approach for web teaching and Learning.

3. What's VISOLE

VISOLE is a learning style that uses a virtual game environment to facilitate learning. The web-based game environment is a simulation of the real world where students participate as "citizens" and take part in shaping the development of the virtual world. It provides a platform for participants to apply the theoretical knowledge to solve problems in a near-real environment, as well as to develop high-level skills for communication and problem solving in addition to subject knowledge. It is usually divided into three stages:

Stage 1: Scaffolding Learning

In this stage, students are scaffolded with high level knowledge and how different areas of knowledge involved are related.

Stage 2: Student Game-based Learning

Students are free to explore in the virtual Game-based environment, which is a simulation of real situation. They are supposed to construct their own knowledge by interacting and collaborating with the others, and searching for relevant knowledge when needed.

Stage 3: Debriefing and Reflection

In the last part, teachers help students to reflect and debrief all the learning process and explain the representative scenarios recorded during the game. Every student is also required to submit daily logs when playing the game. When the whole Game is finished, each is also required to submit a final report.

4. An Example of VISOLE—FARMTASIA

FARMTASIA is a farming system that has been developed under the VISOLE framework involving the subject domains of geography, biology, natural environment and hazard, government, economics, production system and technology.

With consideration to security and cross-platform, we adopt Java to achieve it, and decide to adopt Three-Tier Network Structure, namely the client, the server and the database Tier.

Any players can enter the game at the client side with any Java-enabled Web browser, and their action and instance are both stored. At 3am every night, the server iterates the game state by doing a global simulation of what the players have done during the day. In the simulation, events such as pollution,

prosecution and worker strikes, will be generated and broadcasted to all the players for their next gaming session.

The disadvantage of Java applet is speed. We tackle this speed problem using Frame skipping and Partial Redraw.

In order for the teacher to easily review the students' activities in the farm and to more conveniently extract scenarios for conducting case studies in the class debriefing meetings, an innovative student game-play logging system and replay function are implemented into the game system.

5. The future work

As for the future work, we will conduct some experiments in schools of Hong Kong, and Mainland China, to test whether the VISOLE approach is effective.

6. References

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