

Situated Learning in Class Using Pocket PCs via a Mobile Learning System

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Abstract

Situated Learning plays a key role in education, and it helps learners to realize how knowledge can be used to solve real world problems using authentic learning. This study proposed a framework for situated learning in class-based instruction using pocket PCs. This framework described the learning environment and learning flows. This study on learning environment focused on the outdoors which comprised learning situation and wireless configuration. Additionally, this study developed a mobile learning system for pocket PCs to support the situated learning. The system includes five modules, namely authoring, testing, scoring, management and statistic modules.

1: Introduction

Situated learning is an important teaching method. The concept was first proposed by Brown et al. in 1989. Brown et al. emphasized the importance of learning situations and suggested that learning should occur in real world situations (Brown et al, 1989). The situations are necessary for learning. The situations attempts to make learning meaningful by creating practical learning experiences. Situated learning focuses on using real examples and situations to help learners understand how to use the knowledge to solve new problems happening in real environment. Situated learning provides practical experiences and activities enabling learners to learn new knowledge and skills rather than abstract symbol or logic (Winn, 1993; Suchman, 1987). In a real learning situation, students can actively seek to construct knowledge and experiences. Therefore, making learning situations similar to practical situations can help students in facing a new environment (McLellan, 1996).

Applying the concept of situated learning, the instruction design primarily provides learning environment to

increase knowledge exploring motivation. Applying this concept fulfills three functions. First, students can understand the relation between different types of knowledge via learning activities. Second, students can anticipate knowledge using opportunities. Such an appreciation can indirectly boost their learning motivation. Final, learning situation promotes learning transfer through practical learning activities. Students acquire knowledge through application, so the rate of the knowledge use increases in similar situations (Winn, 1996).

Conducting situated learning requires reference to various real situations and environment. The learning locations can be in classroom or outdoors. Therefore, mobility is important in situated learning. Pocket PCs are suitable for situated learning because students can bring them to a real learning situation to learn. Consequently, the study propose a framework for situated learning using pocket PCs in class and develops a learning system for pocket PCs to support situated learning.

2: Framework of situated learning using pocket PCs

The concept of situated learning stresses that learning should occur in realistic environments (Tripp, 1993). The study focused on realistic environment. Therefore, to conduct situated learning in class-based instruction, the first thing to do is to move to the appropriate learning environment. The next step is to begin teaching and learning. Learning environment and learning flows are described as follows.

2.1: Learning environment

The situated learning may occur in a classroom or outdoors, and the study focused on outdoors, particularly on elementary school campus, including educational gardens or learning corners, and so on. In these

environments students can learn by following the questions or guidance. The environment is shown as in Figure 1.

The situated learning was constructed in learning environments and wireless environment with some access points. Every student had a pocket PC embedded a camera which can surf the Internet.

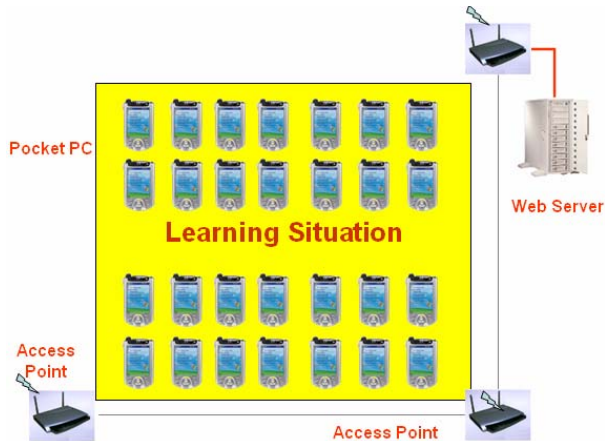


Figure 1: Configuration of mobile learning environment

Besides the core activities involved situated learning, the instruction activities were happened in classroom or certain corner near situation (see Figure 2). Over there a teacher can explain the missions before situated learning and teach and discuss some questions that students cannot figure out following situated learning. In classrooms, teachers and every student have a pocket PC with which they can surf the Internet. The teacher also can use PC or pocket PC to present the teaching material on a whiteboard via a projector.

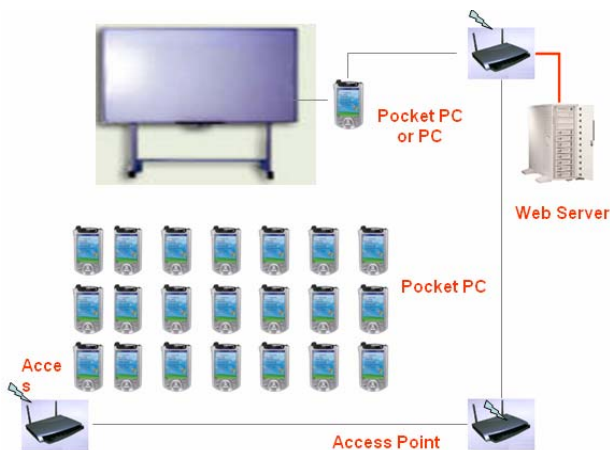


Figure 2: Configuration in classroom

2.2: Learning flows

1. Preparation

Learning activities and assessment play a major role in situated learning. Teacher must design their learning activities and assessment questions before class so that students can follow and reply.

2. Mission introduction

The course began with mission introductions in a classroom (see in Figure 2). First, a teacher explained the unit and mission purpose to students. Then, with presentations through projectors and pocket PCs, the teacher introduces learning environments, for example educational gardens, and learning system with pocket PCs.

3. Activities of learning and assessment

The assessment of situated learning should focus on learning processes and outcomes (McLellan, 1996). McLellan (1996) contend that learning and assessment are simultaneously. Students begin conducting their exploration activities following the explanations of teachers. Learning activity guidance and testing was presented via the personal pocket PCs. Students sought the questions answers from authentic situations. Students then responded to the questions on pocket PCs. For example, the screen of the pocket PC presented “Find a plum blossom on elementary school campus, and then look to see how many petals each blossom has”. Students thus must go to find the plant and examine it before they can give an answer. Additionally, using a pocket PC with its embedded camera, students can identify specific plants and take a picture as requested.

4. Presenting outcome and discussion

Most of student responses can be scored automatically and immediately by the system. Only a minority teacher must score the responses, including open questions and the questions of whether pictures should be taken. Following learning and assessment activities, the teacher can present the assessment outcomes of all their students using a pocket PC and a projector. The assessment outcome can be an overall picture of the whole class, a single student, or even a group. Subsequently, the teacher can discuss the testing results with students. Finally, the teacher can correct student misconceptions and provide conclusions to students.

3: System description

The system which is a web-based is designed to support students in conducting situated learning. All functions were developed on the server. The system comprised five modules, as shown in figure 1.

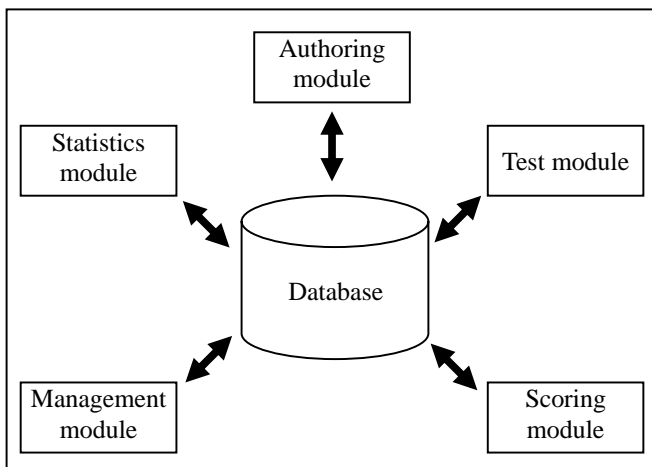


Figure 3: System structure

1. Authoring module

Situated learning emphasizes active learning. Students followed questions and guidance in their learning, so teachers must design questions and guidance before class. The authoring module provides interfaces that allow teachers to create questions online. A teacher can create questions and guidance from scratch or by modifying the questions of other teachers. Therefore, teachers can share ideas with each other. Additionally, the system provides two approaches to question design, including step-by-step design and importing existing file. Types of questions include true-or-false questions, multiple choice questions, gap filling and open questions, and so on. The module provides various media, allowing teachers to integrate files containing pictures, audio and animation into the questions.

2. Testing module

The testing module provides questions on which students on which students are subsequently tested. Student's personal pocket PCs describes questions transmitted from the server via wireless. Generally, the question may accompany guidance or directions. Student followed the directions to find the answer location. Student then sought the answers and responded the question on their pocket PCs. Answer styles could include selecting an appropriate answer from among several choices, writing a free-form answer into their pocket PCs, filling in a blank, drawing a picture, or even taking a picture using the camera embedded in their pocket PCs. Generally, on completion of the worksheet, students can obtain their score and outcome immediately on completing the worksheet.

3. Scoring module

The scoring module was responsible for scoring students' responses. Most of the responses were

automatically scored by the system if the question could be assessed using a single absolute standard, such as in multiple choice questions, and so on. The others may need to be scored by teachers on line, for example the sketch-typed answers, or the photo-typed answers. Restated, not only should the system score student responses automatically, but teachers can score the responses using PCs or pocket PCs.

4. Management module

The module presented information for use by teachers, namely the summarized learning outcome and portfolio of all students in the class and the details for individual students. This module thus enables teachers to deal with the learning state of the entire class, while also monitoring the progress of specific students. Based on this information, teachers teach new material and conduct class discussions, while also providing individual remedial teaching for students who failed the test.

5. Statistics module

The module comprised honor boards and personal data. Honor boards listed outstanding students who had achieved higher scores or completed the test fast, and so on. The personal data included individual student information and learning portfolio.

4: Conclusion

Situated learning stresses practical learning which is important for learners. The study designed a learning system of pocket PCs to support it. The system includes five modules, namely: authoring, testing, scoring, management and statistics modules. Furthermore, in class-based instruction a framework of situated learning was proposed using pocket PCs, including learning environment and learning flows.

By the time this paper was submitted, the evaluation of the study had not conducted to examine this leaning framework and the system. The authors would conduct evaluation to examine the efficiency of the proposed system and learning framework.

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