

# A Treasure Hunting Learning Model for Students Studying History and Culture in the Field with Cellphone

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## Abstract

*In the treasure hunting process, the hunters could only get few hints with simple words, therefore they must think over with the experience they learned before. The goal of this paper is to propose a treasure hunting learning model and implement a system based on the model. Within the treasure hunting learning model students will become a treasure hunter when they are learning in the field. The learning model makes learning more fun by asking students some questions according to their learning records and physical position. In order to make the system portable and treasure hunting liked, we implement the treasure hunting learning model with the most simple and common cellphone, that is the text-mode cellphone. To verify the learning model is working, a traditional history and culture course in college was taken as the experiment.*

## 1. Introduction & Background

E-Learning refers to a learning environment which students and teachers are separated into two different places. Students and teacher could communicate with each others by e-mail, video, or web-cam; networks, computers, and the similar assistant tools are used to support various interactive platforms [1].

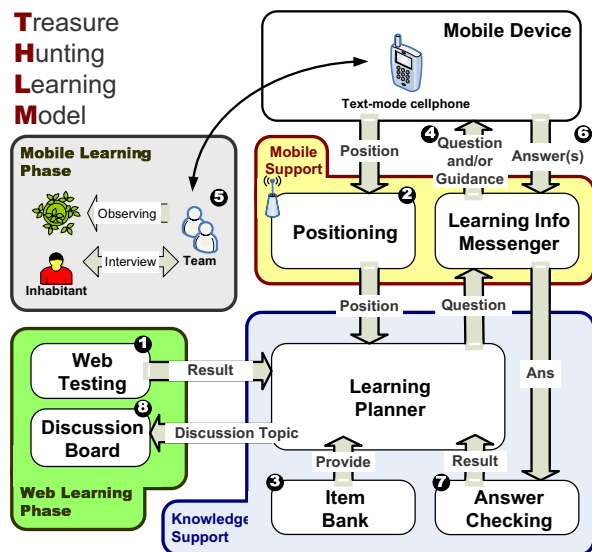
Nowadays, the mobile device development provides e-Learning a new learning way, extends the traditional e-Learning environment from indoor learning (web-based learning) to outdoor learning (mobile learning) [3]. Students could use mobile devices to learn when they are moving in the real world, such as field learning [4]. Moreover, some researchers also integrated both mobile learning and web-based learning platforms together as assistance teaching tools [5].

According to the Ministry of Transportation And Communications, since 2002 Taiwan's cellphone popularity is top one in the world. There were 96.6% people had cellphone(s), every hundred people had 107 cellphone numbers [6]. Although there were only 19.88 millions cellphones in Taiwan on Dec. 2006 [7], there were only 16.22 millions people (71%) belong 15 yrs to 64 yrs [8]. That's the reason why we can even apply mobile learning into high school education (high school and senior high school), because even elementary school students have their own cellphones.

The goal of this paper is trying to extend Computer-Aided Learning systems from web-based learning to mobile learning; design an easy-use and practical educational model. In order to increase students' learning motivations and make students learning anytime and anywhere, this paper proposes a Treasure Hunting Learning Model and implements a mobile educational system which combines both mobile learning and web-based learning, for example, the system will provide students suitable instructions or quests according to students' learning results on web; students could use the text-mode cellphone to get the guidance messages or quiz when they are moving around; what concept students obtained and did not understand during the mobile learning phase will be also posted on the website in order to let teacher and students do further discussions.

## 2. Treasure Hunting Learning Model

There are five major components in the treasure hunting learning model architecture, including two learning phases, one mobile device, and two support tools. Figure 1 shows a complete operation flow and the architecture of the treasure hunting learning model. The function of each parts and operation flow of the treasure hunting model could be explained very clearly step by step with an example in the following.



**Figure 1.** The architecture and operation flow of the treasure hunting learning model

Alex is a college student; he takes a local culture and history e-learning course this year. At the beginning, teacher tells him how to use the learning website and how to make his cellphone to connect with the learning system. Then, teacher asks Alex to study some fundamental local culture materials and take a pre-test on the learning website by Web Testing (as **the step 1** in Figure 1).

After Alex completed the pre-test, teacher divides all students into several two-people groups. Alex and his teammate are asked to go to an old town near by his school with their cellphone. Alex sends the position message to the Positioning module when they got the old town. The positioning module will be activated and send their coordinates back to the Learning Planner (**the step 2**).

The learning planner picks a suitable quest and/or guidance message up from the Item Bank for them according to their web testing results in web learning phase and their physical position (**the step 3**). The question (or says quest) is used to ask students to do some kinds of treasure hunting, they can explore knowledge and solve the questions by themselves just like a hunter, or they can ask the system's help such like a guidance message. For example, a question might like "Which is not the main function of Shi-Men Reservoir? (1). It is a big water-storage tank. (2). To generate electric power (3). For fishing." The question should be able to make student to hunt treasure (knowledge) via asking or interviewing inhabitant around the field learning site.

There are two kinds of guidance messages, assistant message and explanation message. The assistant

message shows students where to go such like "Please move to Shi-Men Reservoir! And watch your step!" or "You are not on the way to next learning spot", the goal of this kind of message is to lead students to get correct learning place. The explanation message explains what students have to do, for example, "Please ask any inhabitant to find out what is the main function of the Shi-Men Reservoir!", this kind of message is also a hint to help students answer their question (solve their quest).

No matter what the learning planner picks up from the item bank, a question or a guidance message, the message will be sent out to the student via the Learning Info Messenger (**the step 4**). And students could choose the answer with cellphone via number button (**the step 5**) and return the answer to the learning info messenger (as **the step 6** shows in Figure 1). Finally, the answer sent from students will be evaluated by the Answer Checking module (**the step 7**). If the answer checking module finds that the answer provided by most of students is incorrect, the answer checking module will ask the learning planner post the question to the Discussion Board on the learning website (**the step 8**) to make students and teacher for future discussion.

### 3. System and Experiment

At the end of this paper, we will describe the mobile educational system with snapshots step by step according to the operation flow of the treasure hunting learning model. The experiment course is a freshman course in college, the local culture and history. There were 10 students took the e-learning course, and the teacher divide them into five 2-people groups. At the course beginning, teacher asked students to study some fundamental knowledge from the learning website as Figure 2 shows; and then asked student to take a pre-test, Figure 3 shows the pre-test interface in the web learning phase.



**Figure 2.** Local Culture and History materials



**Figure 3.** Pre-test in the Web Learning Phase

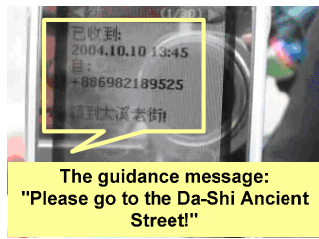
The field learning was doing in an old town, Da-Shi township, in which has plentiful cultural and historical relics. Each 2-people learning group's learning goal in

this township is to “hunt” the “treasure”, that is the antiques and ancient buildings, Figure 4 shows a group is working on the quest with a cellphone.

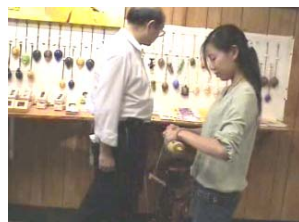


**Figure 4.** a team is working on the quest with cellphone

As mentioned in previous section, the learning planner will pick up either a quest or a guidance message from item bank and send it to the student. Figure 5 shows a guidance message sent out by the learning info messenger.



**Figure 5.** A Guidance Message



**Figure 6.** A narrator explains how to play the whipping top in the toy museum at Da-Shi

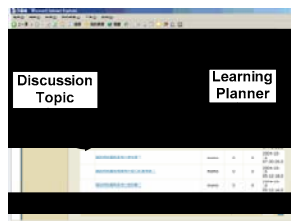
Once the group received the message, they proceed to the Da-Shi Ancient Street in order to get another clue or question. For example, if the group gets a new quest about "how to play the whipping top", then they will need to follow the clues to the toy museum and ask someone who is familiar with that. Figure 6 shows the example.

If a group thoughts that they get the treasure (the question's answer, or says related knowledge) already, they can send their answer back to the system directly by their cellphone. However, if most of groups get

wrong answers, then the system will post the question to the discussion board automatically for further discussion. Figure 7 shows such an example discussion topic, "Which is not the main function of Shi-Men Reservoir?"

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**Figure 7.** Discussion Board