Nature Talk: A Proposed Audible Database System for Environmental Learning

Yutaro Ohashi
Graduate School of Media and Governance, Keio University
5322 Endo, Fujisawa, 252-8520, Japan
utr@sfc.keio.ac.jp

Makoto Arisawa
Keio University
5322 Endo, Fujisawa, 252-8520, Japan
arith@sfc.keio.ac.jp

ABSTRACT
We developed a mobile learning application that permits users to explore and learn a natural environment. By using PDA, learners seek various kinds of sound in surroundings, and record them. Sounds are stored in PDA with position information obtained from GPS receiver, which is embedded in PDA. Sounds are layered on an aerial photo, based on the position information. As the network technology spread to school education, visual information (such as text, photo, etc) will be large in quantity. This project aim at stimulate children’s awareness or creativity, by paying attention to audible information that is gained from surroundings.

Keywords
Environmental Learning, Free Play, Exploration, CSCL, Mobile, Ubiquitous

INTRODUCTION
As the concept of ubiquitous computing [1] is widespread, educational technology is experiencing a paradigm shift. Especially, mobile network technology such as third generation mobile phone, PDA, and other mobile devices are becoming important platform for educational activities. Many projects that support learners in ubiquitous way are attempted [2].

In this paper, we argue the potential of ubiquitous and mobile learning [3], and speculate about their usability for education.

NATURE TALK
This paper describes the design and development of the Nature Talk, an audible database that enables children to explore nature and share audible information that is gained from surroundings. We describe related works about this system, the design concept, and conclusion.

Related Works
So far, in fieldworks, it was difficult for participants to archive or share their experiences. Then, fieldworks tend to be less sustainable. Several researches are observed in this field. Digital EE II [4] is designed to collaborate and share environmental information in 3D cyber space in real-time. Bird Watching Learning System [5] is designed as teaching materials that user can refer in real-time. These systems are mainly designed as communication media or references, they don’t have functionality to collect or archive data.

The design concept
We propose participatory data gathering system. This system permits learners to collect sound data by themselves in surroundings by using PDA device. Learners can share the data on a web site or on a physical sound map interface.

This system is designed to make it easy to share sound data between multiple users, by creating a virtual sound map. Users can recognize sound and its position intuitively, and can aware other users’ information by interacting with sound map.

Educational Effect
This system also aims to develop children’s power of hearing. R. Murray Schafer, the advocate of “Soundscape” [6], indicates the importance of hearing for education.

Besides, learning flow that this system provides makes learning activities more sustainable. First, learners explore nature, seeking sounds in surroundings. This step corresponds to direct experience. And then learners experience or feel nature by sharing sound data on a sound map in face-to-face communication. Those who don’t
experience nature directly also can join in this step. Through direct experience and indirect experience, learners get interested in nature and enrich knowledge.

Software and hardware composition
This system consists of PDA device for individual user and physical sound map interface and web site for multiple users to share the data. Users go out to seek and record sound in surroundings with GPS data, by using Macromedia Flash application on PDAs. When collecting data, user select category and sound icon from drop down list. Sound icons are mapped on the map afterward. After exploring, integrate users’ data on a server from SD memory card, and shows them on the sound map by using Google Maps API.

Figure 2 shows the system image of PDA device and sound map. We have developed prototype system on a PDA (Mio 168RS by MiTAK japan) with windows mobile 2003, GPS receiver, Flash Player for Windows mobile 2003. The application is created with Macromedia Flash. Almost all codes of application are described with Action Script, apart of them is with custom C++.

PRELIMINARY USER STUDY
A workshop using physical sound map interface was held at Shonandai culture center in 7 to 8 January in 2006. There were 20 elementary school children, age6~11. We prepared for sound map of natural park in advance. Children studied nature by using this sound map. In this workshop, we evaluated sound map, but couldn’t evaluate PDA interface. We are planning to evaluate whole system in next workshop.

Judging from users’ behavior, this device seemed to aid collaborative play and work. Participants seemed to enjoy exploring with sound map.

CONCLUSION
We developed a mobile learning application that permits users to explore and learn a natural environment. In the preliminary user study, we observed that this system helped users’ exploration effectively. As the future work, we have to verify the whole system.

ACKNOWLEDGMENTS
We thank for the members in Arith Lab Infoscape Project and Yasumura Lab Interaction Design Project for helpful comments and technical support.

REFERENCES
2. Savannah http://www.nestafuturelab.org/
6. R. Murray Schafer, Sound Education, 1977