A Study of communication technology education - Take PHS phones as example in elementary school

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Abstract: - This study intends to investigate and interview process targeted on the projector who is an executor of the plan of PHS phones from an experimental elementary school located in Kaohsiung County, southern Taiwan. She joined all of digital experimental project and observed interaction between the parents and their own children in the specific elementary school. In the experimental period, the projector observed each parents using a PHS phone; through message transmission and mobile net communication, parents using PHS phones to discuss and share feelings with the teachers as well as other parents. The research summarized the projector’s ideas and provided references opinion to instruction designers and mobile learning projectors to develop further innovative instruction.

Key Words: - PHS phones, instructional design, communication technology education

1 Introduction
People access audio, video, animation data or search for information increasingly via the World Wide Web, while connecting onto the net through the cable is inconvenient. As a result, ‘informational appliances’ discard the PC’s complicated architecture, presenting as simple, low-price, and consumer-oriented [3]. At the same time, we also ask for convenient environment to process learning.

In 1996, the Ministry of Communication in Taiwan proposed to local people a telecommunication business, caused the liberalization of international of telecommunications in Taiwan, and promoted the market more competition. Therefore, the mobile phones have become convenient and necessary in our daily life, and have made the wireless communication market flourishing. Presently the personal handyphone systems (PHS) smartphones’ standard basically with the following features [5]: Large volume phone number and email address book; ‘Emoji’ (i-mode picture symbol) support, multiple typefaces/fonts; fast digitalized telecommunication key and diverse record functions. Its main feature consists of powerful standard transmission and communication protocol in core technology and Java support. Technology and Java support bring excellent performance on wireless networking.

With the advantages of mobility, mobile wireless technologies improve efficiency and effectiveness in teaching and learning [4]. We intend to search answers for this equipment and its relevant infrastructure to see what is going on and where it will bring us to. This study intends to demonstrate the projector’s ideas and PHS phones application on education. In order to provide references opinion to instruction designers and mobile learning projectors to develop further innovative instruction, the educational authorities worked with PHS mobile telecommunication suppliers to carry out an experiment in the future. It will help to determine the feasibility and effect of PHS mobile phone utilization in education.

2 Definitions and Condition
Generally speaking, M-learning is defined as e-learning through mobile devices. Mobile wireless technologies are defined as any wireless technology that uses radio frequency spectrum in any band to facilitate transmission of text data, voice, video, or multimedia services to mobile devices with freedom of time and location limitation [2]. In Taiwan, the production of WLAN exceeded 90 percent in the world. The popular rate of using mobile phone also surpassed 100 percent. We are the number one of using mobile phone in the world. In the plan of “The demonstration and application in wireless broadband network” in Ministry of Economic Affairs, it has helped the 25 cities, the nearly 400 schools, 16 wireless networks industry, 1 telecommunication industry connect with international roaming organizes iPass [6]. This will be helpful to carry out the public wireless region network service in Taiwan schools.

Mobile phones are the most popular and common mobile wireless technology in personal communication tool. People use wireless application protocol (WAP) to access to the Internet from mobile phones. Although it is possible to deliver content to WAP phones, the reading is rarely easy enough. The mobility of the devices used in M-learning scenarios involves a new context data, the thing that needs to be considered is location. The service providers have extremely limited opportunities to offer interactive data services. Interactive data applications are required to support commonplace activities such as [9]: (1) email by mobile phone, (2) sports results, (3) news headlines, (4) music downloads.

In personal or private user mobile phones market, informational appliances focused on hand-held products such as e-mail communicator, e-book reader, mp3 player, website browser, safe protector, personal handyphone systems (PHS), wearable PC equipment. They also offered the functions in teaching and learning applications as follow [1] : (1)Use a tutorial for self-study, (2)Do research on the web, (3)Look up a word in a thesaurus, (4)Give students step-by-step instructions or visual plans for projects.

### 3 Types and characteristics

PHS is basically a wireless telephone, with the capability to handover from one cell to the other. The PHS smartphones’ standard is not unified now, but they still have characteristics as follow: [5] [7] [9]:

1. Many value-added services: Modern PHS phone can also support such as high-speed wireless data, Internet connection, WWW access, e-mailing, text messaging and even color image transfer.

2. Polyphonic sound support plus stereo widening, adjustable brightness: Polyphony chord ringbones are the basic component of the handset. There are stereo widening sound, incoming call ringbones to select, tune-composable and downloadable and even to record. Otherwise, you can built-in brightness mode and make yourself another levels and flashing alternately.

3. Large volume phone number and email address book: There are entries contact phone book, group management, each entry with up to three names and two email addresses, email inbox, and sent messages/drafts outbox. It is easy to manage emails and thumb information, coupled with off-line reading function.

4. MiMi (Mobile Information Mobile Internet) Thumb service: PHS MiMi thumb information is just like the Internet homepage. [8] When your PHS mobile phone is connected to the homepage, you can freely browse any value added services on the MiMi menu, such as: news flash, monthly billing services, categorized menus, and search engines.

5. WiWi Netspeed service: People Avoid troublesome fixed line connections, and get online anywhere with your mobile phone at anytime. WiWi connection equipment has the widest choices, so you can access at notebook PC or all kinds of PDA. The simple operating method and connection settings allow you to easily expand your wireless vision.

6. Fast digitalized telecommunication key and diverse record functions: there are many services, such as: call blocking function, automatic call return, calendar and schedule, alarm clock, through-hole for straps, interchangeable voice-control, as radio telephone within short distance.

### 4 PHS application on education

According to American website K12 Handhelds [1], it offers different ways to use the handheld computer in education. We find great educational benefits and
new ideas of handheld information devices, which include:

1. Administrative applications: Keep your schedule; track student progress on specific skills; conduct authentic assessment; use a calculator; make a database of key content and concepts for student use; take attendance; access into student’s information instantly, such as students’ schedules, demographics, or parents’ contacts; organize your reading lists; take notes at a meeting or in a class, record and tabulate grades; track computer hardware and software inventory; enhance school safety with bar code IDs and an emergency management system; store and access lesson plans; use a rubric to assess and score student’s work; access a database of curriculum standards and related curriculum resources; keep an inventory of books and other instructional materials; store and track student IEPs; track technical support requests; keep a list of all your important contacts; evaluate teacher performance and record observation notes; access, track, and manage library book or textbook inventories; track, organize, and control inventories and safety information for chemicals in the lab; let students have constant access to their current grades (very motivating!); track teacher recruiting activities; access human resources benefits information; look up technical troubleshooting information; keep emergency procedures and checklists readily accessible.

2. Communication and collaboration applications: Send an email; group schedule school meetings; collaborate on a graphic organizer; send or receive a fax; make a presentation; make a phone call; distribute school activity information to students and parents; exchange information with a colleague; share a downloaded web page with someone; send assignment information to parents; have students submit an assignment electronically; get parents’ sign-offs; transfer a file from your PC for instant access; write an e-book and share it with others; take an online course; send and receive instant messages; conduct group writing activities; record voice notes; transmit closed captioning of lectures for the hearing impaired; access online educational events and news.

3. Teaching and learning applications: Take and store digital photos for a project; Make a spreadsheet; Draw a picture; Make a concept map summarizing a chapter; Form, visualize, and solve equations; Keep track of your class schedules, assignments, and grades; Record observations on a field trip. Read an ebook; Find locations with a GPS; Study and compose music; Graph data; View and use maps; Increase content accessibility for those with disabilities; Gather data on temperature, light, voltage, pH, and more with data probes. Program your own handheld application; Conduct a surveying expedition; look up a word in a dictionary; use flashcards; use a tutorial for self-study; conduct a stock market simulation; take notes and write a research paper; take notes in class, practice handwriting; study a foreign language; listen to historic speeches; take part in a collaborative simulation; do research on the web; conduct an academic competition; gather and analyze data on environmental issues; make a timeline; look up a word in a dictionary; create an outline; study for a test; give students step-by-step instructions or visual plans for projects; keep a journal; create fitness records for students; access writing prompts and editing checklists; learn to read and write Japanese characters; learn about concepts in measurement; practice multiplication tables; access the periodic table; manage a collaborative project; look at reference diagrams on parts of the human body; make a photo album; listen to and study classical music; build a robot controlled by a handheld device; track a community service learning project; read about the latest current events; study astronomy; build vocabulary through word games; find or create a gouache; have classes create their own mobile information channels to share information with other classes or the community; create a database of endangered species; read historical primary source documents.

5. Study method

This research went through concerned literature and interviewed the projector. The projector planned PHS phone directly from an experimental elementary school, which participated in digital learning special case located in Kaohsiung County. The projector’s feeling and opinions were discussed. The conclusions were made after the experiment. Later, those reference materials will compile opinion and information to instruction designers and mobile learning projectors to develop further innovative instruction.

6. Procedure

In the experiment, the research team composed a semi-structured interviewing outlines, which were revised by professionals and experts. The interview was carried out by the projector’s observation in
utilizing PHS to express the teachers’ and the parents’ after-thoughts. We would understand what background the projector was.

6.1 Subject background

This study involved an entire class student who is in the projector’s school participating in digital learning special case. Every couple of the parents was assigned with a PHS handset. There were six parents and teachers who stayed for the whole process. However, the projector is an educational expert with experience in using personal digital assistant. She is a director of educational affairs division in Cheng-Jeng primary school in Kaohsiung County.

6.2 Interviewer’s background

The interviewer is an educational expert with experience in using personal digital assistant. He was a professional being consulted in this interview outlines.

7 Analysis and discussion

The keynotes of the projector’s comment were as followed:

(1) As a project initiator in this PHS mobile learning case.
Many kinds of artificial intelligence or technological products are designed for people to process data more efficiently and to make our work more effectively. Therefore, it is very important to teach our students learning how to adapt the artificial environment early via technological implements.

(2) As a project difficulties and opinions in the beginning.
It is very important to learn technological knowledge and scientific thought while as a child, but it fails to give our children new messages about science and technology to study today. When the users face new technology in the beginning, they feel embarrassed to operate it. In addition, it is not easy to change their learning habits. In the face of this predicament, we do our best to communicate with them and offer them assistant with the software and hardware to get familiar in various operational functions in PHS.

(3) As a concrete changes have taken place in users.
We see some changes in the users, including improving their technological knowledge about mobile devices, accepting PHS hand-held in education, sharing their opinions with others and applying cooperative learning in this course.

(4) They find concrete educational application after using PHS mobile learning device.
PHS basically serves as an individual helper. It is not necessary to use mobile devices in class, so it takes a long time to teach parents and teachers to know how important it is. Although, we learn many educations of science and technology from the "PHS Handset case" and we need to teach our students what to learn in future.

(5) Suggest that other projectors to do in the future.
In this course, we have seen that the users change their attitudes toward the science and technology, including attitudes toward using PHS and behavioral intention in usage of mobile devices. In the future, we may design questionnaires to collect data from experimental schools which carry on this special project in order to design mobile learning targets. In addition, we should strive for the new scientific and technological products to give our students a chance to enable them accept the education of science and technology in the basic education early!

8 Conclusion

Many educational opportunities are made possible in the future because of mobile technologies’ unique characteristics and positive impacts identified progressively in education. Using technology products bring additional value for teachers, parents and their children. In the beginning, lack of proficiency may cause inconvenience for users, but making up their minds to try new things is really rewarding. We were happy to hear that PHS had been gradually accepted in education, and was used to encourage good interactions between parents and teachers. We would be glad to offer the m-learning environment choice in elementary schools.

In this article, we examined many resources and cited studies to answer the practicability of mobile wireless technologies in basic education. This research intends to demonstrate the projector’s ideas and the application of PHS phone on education, in order to provided references to instruction designers and mobile learning projectors to develop further innovative instruction.
We summarize from documents of the interview and discovered as follows:

(1) It is very important to teach our children to learn how to adapt the artificial environment as earlier as possible via PHS hand-held.

(2) Only when we do our best to communicate with parents and teachers; they will become familiar with various operational functions in PHS. Meanwhile, they can offer assistance in the software and hardware development.

(3) PHS has been gradually accepted in education. Meanwhile, it is used to encouraging interactions and communication between parents and teachers.

(4) We learn many concept of mobile learning from the "PHS Handset case". We will know what our students want by learning in technological education.

(5) We will strive for the new mobile products to give our students many chances to learn the education of science and technology in elementary school. We hope that our contribution will encourage other researchers to look at the big picture, how we presently design to interact and communicate between parents and teachers in small devices. Through this experiment, the projector and the research team received good response and effects, which were proven useful in education. These enhancements will be crucial for supporting the growth of mobile devices in education.

References: