Handheld Mobile Net Devices and its Application in Education

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Abstract: This study intends to investigate handheld mobile net devices and its application in education. The study went through literature review and staged interview. The interview process targeted on students and parents from an experimental primary class located in Kaohsiung County, southern Taiwan. They all joined the digital experimental project in that specific primary school. In the experimental period each parent in that class were distributed a PHS phone. Through message transmission and mobile net communication, parents discussed and shared feelings with teacher and other parents through using mobile devices (pros & cons). The research summarized their usage and provided reference opinions information to county commissioner and educational related officials to encourage further innovative pedagogy use.

Keyword: handheld mobile net devices, innovative pedagogy

1 Introduction
Rising Internet population has made net surfing a part of daily life activities. More and more updated versions of mobile devices are going to bring rapid expansion of wireless network. According to eTForecasts report, the number of Internet users surpassed 1 billion in 2005 globally among which connection via the wireless takes 365 millions; the U. S. continues to lead with nearly 200 million at year-end 2005, followed closely by Japan, China, Germany, and U. K., Taiwan ranking as the 15th. The report estimated spread of wireless internet access and upgrade of related devices will have a major impact on growth of internet population in every country and change the ratio of distribution of internet users across the globe[1]. North America, west Europe and some Asian Pacific nations including Taiwan are projected to get ahead on wireless internet communication in 2010. For this reason, in order to have a clear view of what consequences future progress of these equipment and relevant infrastructure are going to bring about. Taiwanese educational authorities worked with PHS (Personal Handy phone System) mobile telecommunication suppliers to carry out an experiment that would help determine the feasibility and effect of PHS mobile phone utilization in education. This study intends to demonstrate handheld mobile net devices application on education, to provide reference opinions and information for teachers and educational related officials in charge.

2 Definition and Market Condition
The wide distribution of internet services made it an indispensable part of daily life. Trends of digitization, broad-band internet, and interaction promote integration of conventional consumer electronic products with computers and the internet. People increasingly access audio and video data or search for information via the world-wide web, while the out-of-date way of connecting onto the net through a computer is complex and expensive. As a result, ‘informational appliances (IAs)’ discard the PC’s complicated architecture, presenting as simple, low-price, and consumer-oriented[1]. There hasn’t been yet an explicit standard as to what exactly is IA; however, all those which have internet functions and are able to exchange and process information with other devices can be named IAs.
IAs are categorized according to different application environments into three realms as of enterprise-wide network computing environment for business users, multimedia entertainment for household users, and mobile information or message for personal users. Among which the business user market includes such as net call, thin-client windows-based terminal; house-hold user market covers net TV, internet game console and screen phone; personal or private user market focuses on hand-held products such as the palmtop computer, personal handyphone systems (PHS), smartphone, mp3 player, wearable PC equipment (Web Pad for example)[2].

According to IDC, an information technology market research firm, the so-called smart or intelligent hand-held devices come in various types, basically with personal information management function, simple text-edit, weighing less than one pound, synchronization with a PC, but not necessarily with voice connectivity. However with more and more functions converging on a single unit, old type data-centric PHS have been replaced by those facilities with capability of telecommunications, sending or receiving emails, internet browsing. Today, United States leading these world hand-held mobile net devices market, followed by Japan, etc[3]. Taiwan does not possess much of proportion of the global market, though, the number is stepping up.

3 Types and characteristics
Presently the PHS smartphones’ standard on the market is not unified, but basically with the following features[4]:

1. 32-chord polyphonic sound support plus stereo-widening, adjustable 7-level brightness: Polyphony chord ringtone is the basic component of an in-style hand-set. 32-chord stereo widening sound, or up to forty-three incoming call ringtone to select, tune-composable and downloadable and even to record. Otherwise, you can built-in 7-level brightness mode and make yourself another seven levels, flashing alternately; there will be fourteen possible incoming call flashing effects. Here several examples are cited.

2. Large volume phone number and email address book: 200 entries contact phone book, 10 group management, each entry with up to three names and two email addresses, 200k email inbox, 100k sent messages/drafts outbox and 100k for MiMi (Mobile Information Mobile Internet) Thumb service, easy to manage emails and thumb information, coupled with off-line reading function.

3. ‘Emoji’ (i-mode picture symbol) support, multiple typefaces/fonts: 95 kinds of emoji (the Japanese name for the picture characters or emoticons for use in wireless messages); 223 sorts of typefaces; 271 entries of hot chitchat term with 221 resident and 50 free to make up (of up to 18 characters).

4. Entertaining: Several inherent games such as Solitaire and BrickSmash.

5. Fast digitalized telecommunication key and diverse record functions: MiMi Thumb service, call blocking function, automatic call return, calendar and schedule, alarm clock, through-hole for straps, interchangeable voice-control (voice command and voice-dial), Walkie-Talkie, as radio telephone within 100m, no need to change the handset when taking a trip. The initial concept for PHS design in Taiwan is EPOC, the operating system for hand-held devices which has the largest coverage in Europe. In addition to application in PHS, EPOC has also been used in tiny-scale computers (Psion 618c) and mobile phone systems (Ericsson R380 and Nokia 9210). Its main feature consists of powerful standard transmission and communication protocol in core technology and Java support which bring excellent performance on wireless networking. Plus Unicode double-byte character support’s birth which solves Chinese character’s display problem, EPOC’s future prospect is competitive.

4 PHS application on education
According to American website K12 Handhelds[5], great educational uses for handheld information devices include:

1. Administrative applications: Keep your schedule; Track student progress on specific skills; Use a calculator; Instantly access student information, such as schedules, demographics, or parent contacts; Organize your reading lists; Take notes at a meeting or in a class, Record and tabulate grades; Store and access lesson plans, Store and track student IEPs; Track, organize, and control inventories and safety information for chemicals in the lab.

2. Communication and collaboration applications: Send an email; Send or receive
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; Gather data on temperature, light, voltage, pH, and more with data probes. Program your own handheld application; Conduct a surveying expedition; Take notes in class, Practice handwriting, Study a foreign language, Look up a word in a dictionary, Practice multiplication tables, Access the periodic table, Listen to and study classical music; Gather and analyze data on environmental issues, Keep a journal, Make a photo album; Create fitness records for students; Manage a collaborative project[8]; Read about the latest current events. Study astronomy. Build vocabulary through word games.

5 Study method
This research went through concerned literature and chose a class in a Kaohsiung county participating in digital learning special case, and then every couple of the parents was assigned with a PHS handset. After experiencing sending messages and mobile net function, their feelings and opinions were discussed and conclusions were made. Later those reference material will be sent for educational officials in charge.

6 Procedure
After selecting teachers to participate in the experiment, research team composed a semi-structured interviewing outlines revised by professionals and experts. The focus group interviewed was carried out to let teachers with experience in utilizing PHS to express their after-thoughts. To understand how this can assist in communication between teachers and parents.

6.1 Subject background
This study involved six parents and teachers who stayed for the whole process. Therefore, they are the most demonstrative and meaningful cases in this study.

6.2 Interviewers’ background
Educational experts with experience in using personal digital assistant were professionals being consulted in this interview outlines.

7. Analysis and discussion
Keynotes from the interviewer are as followed:

7.1 In the early phase of using PHS digital assistant, it’s of little help.
During this time they just began to get familiar in PDA’s various operational functions. “An idea pop to my mind that the digital gadgets may be useful in students’ management and record keeping. For the first time, I was not used to it, sometimes I found it even more troublesome than writing down on papers. (AA01) Now PHS is popular, my family and my students are happy that I learn to use the high-tech, they cooperate in educational activities and anticipate new functions of PHS,” said a teacher. (CC01)

7.2 Accumulated using experience in promoting parent-teacher exchange.
As time goes by, PHS hand-held experience and associated websites can give all sorts of solutions and reference it also encourage communication. Another example, “ I discovered self-made PHS programs is useful in teaching. I’m testing all the practicability and suggest the parents try to use it, though the effect yet to be proved. (BB02) Occasionally, I would express my own experience, share it on the internet and surprisingly some friends gave advices. So PHS became my trustable assistant.” (DD03)

7.3 PHS personal digital assistant, originally for telecommunication,
considered novelty as catalyst for parent-teacher exchange.

PHS PDA basically serves as an individual helper. As the internet contributes to enthusiastic discussion between users, more people have become familiar with this new technology. “Creative thinking results in great ideas, so many users join the on-line discussion of the experience using PHS PDA. Once I found a website where a few skilled users share their ideas, which bring me a lot of help.” (FF03) “To draw a picture with hand-held information devices, to make a record of field trip of the science and technology course; in that way teachers and students can share their experience. It’s fun and eye-opening.” (BB05)

7.4 In addition to communicability, leading teachers’ contact and use technology is also the key to parent-teacher interaction.

The educators put science into practice, to incorporate new technology into pedagogy. As witnessed by an experimental teacher, “Children enjoy playing high-tech devices such as GameBoy while we use PHS PDA. So, it is not hard to understand for them. PHS is easy to accept for the kids, and it is a great companion for teachers who have to keep record on class events and follow school schedule” (EE05) “PHS makes me popular in the school. The students said it is cool. It looks like that I bring at hand a mini-computer. I regularly use a notebook or overhead projector etc.; it is an extra auxiliary device in teaching. High-tech brings me refreshment and different values. It keeps me up to date.” (BB04)

8 Conclusion

To summarize from documents of the interview we discovered:
1. PHS provided little help at the initial stage of usage.
2. Increasing experience stimulates more frequent exchange.
3. PHS has been gradually accepted in education, and is used to encourage interactions between parents and teachers.
4. More importantly, PHS is the key to communicate between parents and teachers and is a guideline to usage of new technology.

Technology product utilization brings additional value for teachers. From the beginning, lack of proficiency may cause inconvenience, but insistency and determination of trying new things is really rewarding. PHS PDA is just a tool, persons who using it is the deciding factor. Features of multimedia adjust for personal need and make it portable can be useful on different areas and will broaden the scope of information technology. Through this experiment, research team received good response and effects are proven to be useful, which will be rendered as references for people who willing to attempt cutting-edge technology in education.

References