The Digital Instrument Support Teacher's Instructional Innovation

Rong-Jyue Fang, Hung Jen Yang, Hua Lin Tsai, Chi Jen Lee, ,Dai-Hua Li

***Abstract*—**This study intends to investigate Digital Assistant (PDA) is 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 parents 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). Finally, as reference material, it concludes by making suggestions for educational government authorities, primary school administration departments and teachers who utilize PDAs to achieve teaching innovation.

***Keywords*—**Digital Assistant (PDA) , Teaching innovation.

I. Introduction

In recent years, with the emerge of Internet, Information Appliance (IA) has become the hot product in new 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 15thsion, videotape, radio, etc. Having witnessed that, the PDA is expected as another tool incorporated into education, enhancing students' diverse contact and application of the cutting edge, and then further analysis and comparison in order to create new or convey the information acquired.

This study intends to demonstrate handheld mobile net devices application on education, to provide reference opinions and information for teachers and educational officials in charge.

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[9]. 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 Handyphone 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 officials in charge.

Rong-Jyue Fang, Senior Professor, Department of Information Management, Southern Taiwan University of Technology, Taiwan (R.O.C.)
Hung Jen Yang, Department of Industrial Technology Education National Kaohsiung Normal University, Taiwan (R.O.C.)
Hua Lin Tsai, Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan (R.O.C.)
Chi Jen Lee, Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan (R.O.C.)
Dai-Hua Li, Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan (R.O.C.)

II. Definition and 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 [9]. 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.

Casio Inc. But the Apple announced Newton, HP and Sharp also made public their versions in August 1993, two months earlier than Zoomer, and then Zoomer didn't sell well. Besides, too big size and lack of practicability so far, the market response wasn't good, so gradually many companies stopped investing in PDA development until 1996 Jeff Hawkins introduced the prototype Pilot 1000 of the Palm family with Graffiti the handwriting identification system and pocket size and single item sale price 299 dollars, which was well-received in the market. While developing Pilot 1000, the Palm Computing Inc. was bought by U.S.Robotics which was merged by 3COM in 1997. As a result the Palm Computing became a department of the 3COM. The 3COM announced

 Manuscript received Sept.19, 2007; Revised received Dec.18, 2007

Palm III's entry into the market in 1998 spring, which with good marketability established Palm Pilot market share eversince[8].

A. Definition situation

Due to the complex and expensive conventional connection onto the Internet via computers and for meeting specific demands, the Information Appliances do away with the PC's complicated architecture and occur as simple, According to IDC, an information technology market research firm, the so-called smart or intelligent hand-held devices come in various types low price and consumer-oriented. At present time there hasn't been a clear definition of the Information Appliances but as shown by existing related products all which can be networked or exchange information with another IA device can be described as IAs. one device can be said to be a PDA as long as it provides some sort of personal digital assistance. United States leading these world hand-held mobile net devices market, followed by Japan, etc. [2]Taiwan does not possess much of proportion of the global market, though, the number is stepping up[4] [5].

It once possessed twenty-six percent in the American retail market in less than six months. The second large market is Japan, where according to survey the sale was 994,000 units in 1999, about fifteen.Now the US is the main market of PDA[1], occupying around seventy percent, among which the retail has thirty to forty percent, indicating the PDA has been gradually accepted by the public. In view of this the Handspring, after being authorized for OS by the Palm, quickly entered the consumer market and caused hot purchase all the way from cyberspace net shops to large computer sale shops [6], percent in the global market. But in 2000 its global share decreased to twelve percent despite global rise of some forty percent to one million and two hundred sixty four thousand units. while domestically in Taiwan there have been the Acer, Asus, etc. joining PDA manufacturing.

B. Type application on education

According to American website K12 Handhelds(2002), ducational 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.
2. **Communication and collaboration applications:**
   Send an email; Send or receive a fax; Make a phone call; Distribute school activity information to students and parents [2]; Exchange information with a colleague; Share a downloaded web page with someone. Send assignment information home to parents.
3. **Teaching and learning applications**:
   Take and store digital photos for a project; Make a spreadsheet; Draw a picture[3]; 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 [7].

C. Characteristics of digital tools

Presently the PHS smartphones' standard on the market is not unified, but basically with the following features [10]:

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.

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.

III. APPLICATION ON EDUCATION

According to American website K12 Handhelds(2002), 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 a fax; Make a phone call;

Distribute school activity information to students and parents [11]; Exchange information with a colleague; Share a downloaded web page with someone. Send assignment information home to parents; Have students turn in an assignment electronically [12]; Get parents' sign-offs; Transfer a file from your PC for instant access; Write an ebook and share it with others; Take an online course ; Send and receive instant messages; Conduct group writing activities; Record voice notes; 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; 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 [13]; Read about the latest current events. Study astronomy. Build vocabulary through word games.

IV. 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. School is a learning place in nature. It is also a place to cultivate people for social move up. Today facing the rapidly changed and chaotic social environment, school education meet the great challenge. Teachers must learn creative thinking and communication technology fast and efficiently. From these remarks teacher would get four benefits by using knowledge management [3]. (1). Promote the teacher's morale, (2). Enhance the teacher's cohesion, (3). Recruit the content of school database. (4). Upgrade the quality of pedagogy. The meaning of organization practicing knowledge management is by the procedure of knowledge access, sharing, application, and innovation to gather knowledge of members, to accumulate organization wisdom, and to establish the competitive advantage. 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 their feelings and opinions were discussed and conclusions were made.

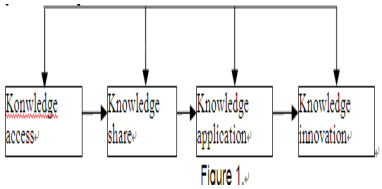

Figure 1.

In addition to these, information technology plays an important role in promoting the knowledge management strategy. There is fairly general agreement in many literatures to the use type application on education.

A. Subject background

The research procedure of this research, after probing into relevant documents, through time of focus group interviews , understand it utilize implement palm type individual several assistant on teaching gains that practice work. improve the transition situation innovated in teaching.

B. study of the case

Research this have eight case in all, individual several user of assistant all at ordinary times, and apply it to teaching. So, these eight teachers become this representative case of research.

C. the interview outline result spends the target

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 papersexpert in order to set up the interview outline of research result degree, have deep use experience and research via PDA to individual.

V. 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.

A. 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.

B. Interviewers' background

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

VI. Analysis and Discussion

Analysis via the interview text, divide and state it as follows:

- The case teacher is using individuals in the auxiliary teaching initial stage of PDA, PDA' every application function is waiting to be familiar with to individual; So,

it is unable to innovate teaching helpfully. Sometimes even than bring paper is it take a lot of trouble to write down.

- The teachers will do some good to use experience with growth of time while using individuals PDA, relevant websites offer the consultation of various fields and get in touch , irritate the teachers and carry on the try innovated in teaching.

The PDA have been assisting a personal technological assistant all the time , the teachers use individuals although the proportions of PDA are not high, with the facility of the internet network, these use past master to concentrate it in the network , form application of a share agitation , harangueing it to apply to gains on teaching, teaching innovates to using PDA teachers , it is no longer a fresh noun . PDA share the gains to individual on the case teacher now, analyse that descriptings as follows: too, is really interesting, students think it very fresh (hh05) too.

Keynotes from the interviewer are as followed:

A. 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)

B. 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)

C. 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)

D. 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)

VII. Collaborative Online Network

Due to the liberalization of global economy, all trades and professions emphasize on the promotion of English comprehension in order to expand their international markets, and to keep themselves in the same pace with global economic development. To improve the competitiveness of the country, the government has proposed that enhancing students' English comprehension as an important policy. The Ministry of Education suggests the perspective of 'Creative Taiwan, connecting globally', in which 'fostering talents with foreign language abilities' is one of the action plans. Due to the universal availability of the internet and the rapid development of multimedia techniques, e-learning has become an important learning tool. Digital teaching materials produced with multimedia films and pictures provide various and more active content of courses. Meanwhile, there is less restriction on space and time using digital teaching material and that provides a more interactive and convenient learning environment. Therefore, using multimedia digital teaching material on international interactive teaching is a necessary way of learning in this digital era.

The Ministry of Education has provided many resources of learning, such as the teaching resources center, the Six Major Learning Systems, and seeded schools to encourage teachers applying computer into their teaching, and to encourage students using internet. The digital plan of augmenting manpower will bring wireless internet to each school, each city and county. Thus, instructing teachers and students in using online information to connect with the world currently becomes an important issue.

E-learning has been developing in recent years. There are many academic organizations using internet as a learning bridge among students to enable them to make use of online resources and to connect the world. Multimedia and interactive e-learning are used to narrow the gap among students, to promote international cooperation, and to implement international exchange. Currently, there are 3 million students and 250,000 high school and primary school teachers. If we can strengthen the use of internet on teaching, it will be helpful for

interactive learning.

VIII. Discussions on Web-Enhanced Project-Based Learning in Connection with the World

1. Inter-Disciplinary Courses and Problem-Based Learning

[11]pointed that interdisciplinary courses have four features. First, inter-disciplinary courses are based on important issues in real life and thus it is similar to the nature of project-based learning. Second, inter-disciplinary courses apply knowledge of context rather than limited to knowledge of subject matter. It conforms to the feature of project-based learning that it is inter-disciplinary and designed to explore a question which combines contexts in real world. Third, inter-disciplinary courses do research on current issues, not on a subject. Project-based learning also does researches on current social or scientific issues and aims at fostering student's ability in exploration and research. It is not limited to the aim of the courses, either. Fourth, inter-disciplinary courses emphasize on applying knowledge and solving problems which are also one of the key features of project-based learning.

2. Discussing Project-Based Learning with Constructivism

Constructivists consider that knowledge is understood by a learner's construction. Students should express the learning results by applying surface features of diversified knowledge. Knowledge and techniques already possessed by a learner may influence on learning something new. Learning cooperatively and learning to interact with communities will help in depth learning[14]. PBL also emphasizes on a learner's construction of knowledge, and thus adopts a learner-centered model. Instructor will not tell the answer but instruct students in exploring questions and trying to solve problems. Learner constructs his/her knowledge by himself/herself in the process of exploring. Products of PBL can be presented with oral presentation, website, and briefing, etc.

3. Cognitive Psychology and PBL

Huang & Hsu pointed that cognitive psychology highlights on learning motivation, fostering students' meta-cognition and ability of self-management which are related to PBL (1). Learning motivation: a learner who has internal motivations attends an activity based on his/her interests. (2). Meta-cognition and self management: Bereiter and Scardamalia indicated that the difference between an expert and a beginner lies in better meta-cognition and ability of self-management an expert possesses. Meta-cognition is the cognitive process and the results of a learner's self-examination. A learner will have more efficient process of learning if he/she knows his/her cognitive process, adjusts his/her learning pace, and adopts remedial measures when facing difficulties. (3). Context: cognitive psychologist place emphasis on the importance of context, considering that learning may be more efficient if the learning system is closer to real life[15]. PBL chooses the important issues around the world and encourages a learner to apply what he/she has learned to make a decision and solve the problems.

4. PBL and the Internet

Added on the elements of science and technology, PBL is different from the traditional teaching method either on the development of course content, or the way of delivery. Teachers can apply internet technology to create different learning opportunities, obtain learning resources, manage teaching resources, and evaluate students' learning results through internet.[16]Information Technology-Assisted PBL can help students develop diversified skills, enhance research skills, and master diversified evaluation methods, such as self-evaluation, peer evaluation, and learning process files, etc. Furthermore, it can promote common consensus in a community through online discussion board and interaction between peers, instructors, and experts. [17]

5. The Internet Provides Learning Communities Channels for Collecting Distributed Knowledge

Learning communities are formed by learners based on different social relationship, such as schools, clubs, organizations, and neighbors, to provide learners a learning opportunity. [18] In this learning environment, the emergence of knowledge relies on the interaction in the community to integrate professional knowledge possessed by different members. Therefore, [19]indicated it as 'distributed cognition' in a learning community. Learners can share their views on how to solve the problems and reach an agreement to examine and solve the problems collaboratively. The Internet plays an important role as the medium for communication in integrating distributed cognition.

6. The Internet Provides PBL Functioned with Scaffold Knowledge Integration (SKI)

PBL is used widely in teaching strategies. The typical mode is the Knowledge Integration Environment (KIE) in University of Berkeley. (http://kie.berkeley.edu/KIE.html)[20]pointed that the four points of SKI are: 'identify new goals for learning,' 'make thinking visible,' 'encourage lifelong learning,' and 'provide social support.' These promote learners' ability to solve problems through repeated examinations and correction.

In a word, this project is expected to encourage schools and local communities to share resources, achieve development collaboratively, and enhance the connections between school education and the world. Students from different countries share learning experience through the process of exploring the issues, researching, and designing websites. We would hope to develop this project which can serve as a bridge for children in the world to encourage them care and help each other.

IX. Purposes of the Project

This project aims at providing opportunities for students attending international activities under their teachers' supervision. The purposes of it are as followed:

1. To foster juveniles' abilities of attending projects, and promote their competitiveness.
2. To broaden juveniles' views, develop their scientific and humanistic care.
3. To encourage juveniles' interests in international cultures and affairs.

4. To enrich international teaching activities, and develop friendship.
5. To enhance students' ability of communication, and students' global vision.
6. To advance students' communication ability in English.

This project combines digital information and the Internet to instruct students using PBL to search information to progress online teaching and learning.

X. Schedule of the Project

This project is scheduled from August, 2005 for three years in three phases:

1. Starting the project (August,2005-July, 2006)

. Develop interactive mode of learning online.

. Search for foreign partners.

. Decide purposes and methods.

. Train teachers with action research.

. Learn interactively online.

2. Cooperation Period (August, 2006-July, 2007)

. Advance international exchange. (It holds interactive and non-interactive activities.)

. Encourage teachers to have international exchange.

3. Creation Period (August, 2008-July, 2009)

. Learn collaboratively.

. Attend foreign web-based competitions.

This project is designed because juveniles should be encouraged to care the important issues around the world, to work collaboratively with team members, and to broaden their global views.

XI. Contents of the Project

1. Purposes

. Connect with the international society.

. Develop students' ability of project-based learning.

. Explore international issues.

. Enhance students' abilities of foreign languages.

2. Set up the Website

The website is set up as the center of communication. Teams, information, and interactive functions will be provided online, including:

◆Teaching platform: including courses and members management.
◆Interactive platform: including interactive texts, emails, international members, and the discussion board.
◆Web server: providing storage space for members.

3.Members

The major members are students from primary schools and high schools in Kaohsiung, as well as those in southern Taiwan. Each teacher instructs 3-5 students. 400 teams are expected to join this program.

4.Procedure of the activity (6 months for each session)

A. Organize teams.
B. Search for international partners.
C. Register to attend.
D. Propose the plan, and set the title.
E. Start international activities.
F. Record the process.
G. Write reports.
H. Attend related international competitions. (Optional)
I. Publish results on the website.
J. Invite experts to evaluate the results.
K. Announce outstanding groups and award them.
L. Hold international workshops to share experiences.

5.Modes of Activities

A. Titles can be decided freely by each team, either learning subject matter or English.
B. Partners can be searched by each school or assisted by this project.

6.Networks

There are four networks:

a. International Education and Resource Network (iEARN)
b. Advanced Joint English Telecommunication (AJET)
c. Asian Student Exchange Program (ASEP)

English teaching (such as international online teaching)

7. Contents

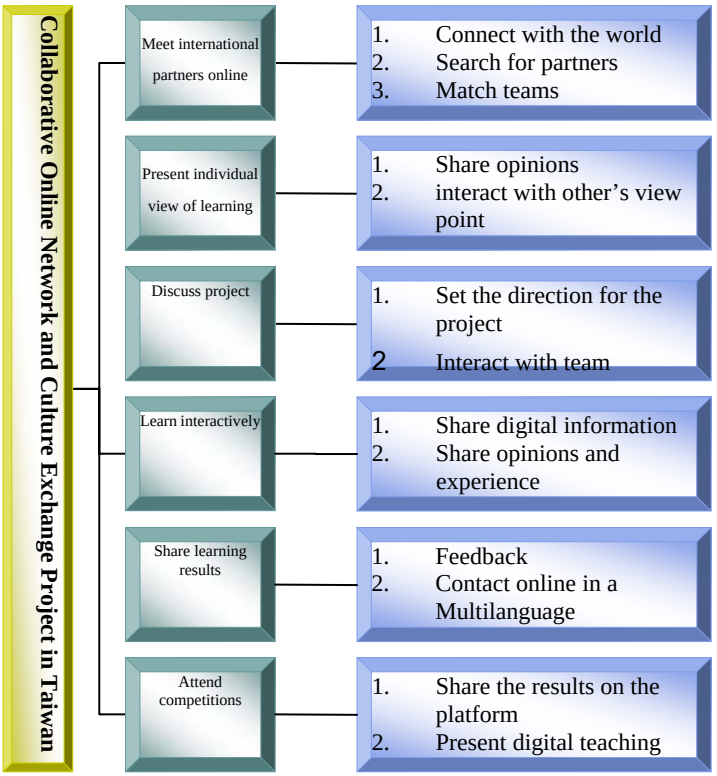

Table 2: the structure of the project

This project is aimed at building a high-quality online learning environment, integrating learning resources, improving online learning environment, and stimulate teachers' motivation of learning. It is hoped to promote

e-learning at domestic schools and to achieve the perspective of 'Creative Taiwan, connecting globally.'

XII. 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 product brings 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 also offer the m-learning environment of 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 opinion information to instruction designers and mobile learning projectors to develop further innovative instruction.

We summarize from documents of the interview we discovered as follows:

(1) It is very important to teach our children to learn how to adapt to the artificial environment early 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 by offering assistant with the software and hardware.

(3) PHS has been gradually accepted in education. At the same time it is used to encourage interactions and communication between parents and teachers.

(4) We learn many concept of moblie learning from the "PHS Handset case" and we will know what our students want to learn 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 to the mobile devices will encourage other researchers to look at the big picture of 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 that were proven to be useful in education. These enhancements will be crucial for supporting the growth of mobile devices in education.

The interview To summarize from documents of the interview we discovered, one initial stage such as assistant such as individual, innovation in teaching almost there is no help. individual several assistant apply to teaching, it has not already been rare. except innovating in teaching , lead the teacher to be exposed to and use technology , it is a fountainhead innovated in teaching even more. echnology 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

[1] K12 Handhelds. (2002). 101 GREAT EDUCATIONAL USES FOR YOUR HANDHELD COMPUTER. Retrieved October, 1, 2006, from the World Wide Web: http://www.k12handhelds.com/101list.php

[2] eTForecasts (2005) focusing on the PC and internet industries Jan,25, 2006, from the World Wide Web: http://www. eTForecasts.com /pr/pr201.html

[3] K12 Handhelds. (2003). 101 GREAT EDUCATIONAL USES FOR YOUR HANDHELD COMPUTER. Retrieved October, 1, 2006, from the World Wide Web: http://www.k12handhelds.com/101list.php [4] Oliver Holme and Mike Sharples, "Implementing a Student 2002.

[4] Karsten Menzel, Raimar J. Scherer, "Information Management for Project Based Teaching Supported by Mobile Devices" 2002.

[5] Jill Attewell, et al., "MLEARN 2003: learning with mobile devices", The second annual MLEARN conference, 19–20 May 2003 [5] The m-Learning Project, http://www.m-learning.org/

[6] T McCarthy, J.(2005). The PalmGuru Report On Palm and Pocket PC. PC 2000 Magazine.

[7] Douglas E. Comer, "Internetworking with TCP/IP – Principles,

[8] Lynch, P.& Horton,S.(2005). Yale C/AIM Web Style Guide. Retrieved Aug 2, 2003, from the World Wide Web: http://info.med.yale.edu/caim/manual/index.html

[9] McCarthy, J.(2005). The PalmGuru Report On Palm and Pocket PC. PC 2000 Magazine.

[10] Zahner, J.(2002). Teachers explore knowledge management and E-learning as models for professional development [Abstract]. Tech Trends, 46 (3) , 11-16.

[11] Bean, J. A. (2003). On the shoulders of giants ! the case for curriculum integration. Middle school Journal, 28, 6-11.

[12] Huneok, O. (2000).Corporate Knowledge Management and New Challenges for HRP. (REIC Documemt Reproduction Service No. ED:441126)

HUA- LIN TSAI, A)Studies : Technology education and its Application

b) Academic Positions: 1. Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan 2. Director of Education Division 3. The information instructor of Kaohsiung county in Primary School 4. Assistant in CONCEPT projet **(Ministry of Education, Taiwan)**

c)Scientific Activities: Technology education and its Application

- Technology—in Primary School
- Health and Physical Education
- Art and Humanities
- Music

d) WSEAS Activities (papers, sessions, organization of sessions, organization of conferences, books, special issues in the journals etc… within WSEAS)*

- 1.At 2006 to 2008 WSEAS publications Journal total(EI) 21 papers.
- 2. WSEAS International Conference on EUROPEAN COMPUTING CONFERENCE (ECC '07)-2007/09/24-26/ special issues chair.

Dr. Rong-Jyue Fang – 1984 graduated from The Pennsylvania State University IED Department PhD program. He had been Director of Computation Center, Department Chair of Industrial Technology, and Dean of R&D Office in National Kaohsiung Normal University, later, been a President of National Taitung (East Taiwan) University. In 2005, he moves to Southern Taiwan University of Technology as a Chair Professor. He concentrates his research on multimedia hardware, software, and system development for more than twenty years and gain more than twenty years

financial support from Taiwan's National Science Council. In recent years, he works mostly on 3D Interactive Model Web.

Hung-Jen Yang is a professor in Technology Education at National Kaohsiung Normal University. He obtained a Master in Technology Education from University of North Dakota and a Ph.D. in Industrial Technology Education from Iowa State University. He is currently conducting research on knowledge transfer, and knowledge reuse via information technology. His research has appeared in a variety of journals including those published by the WSEAS.