A Model of the Personal Digital Assistant Promoting the Teacher's Instructional Innovation

RONG-JYUE FANG¹, YUNG-SHENG CHANG², CHI-JEN LEE³, HUA-LIN TSAI⁴

¹Chair Professor, Department of Information Management, Southern Taiwan University of Technology, Taiwan
³,⁴PHD, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan
²Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan
*No.188, Zhong yi St., Fengshan City, Kaohsiung County 830
Taiwan,

* kittyhl@gmail.com
rx26@mail.stut.edu.tw
mickeylee@gmail.com
pluseme@gmail.com

Abstract: This model aims at understanding that Personal Digital Assistant of case teacher promotes the course of teacher's teaching innovation. It adopts the research approach of focus group interview. The objects of interview are six teachers who teach Nature and Science Technology at National Elementary school in Kaohsiung. This research discovers that more and more case teachers participate teaching innovation, and accept some stimulation like specialized knowledge and teaching experience sharing.

Keywords: - Personal Digital Assistant, teaching innovate.

1 The background and motive of this research

In recent years, internet network agitation lets IA (Information Appliance) become a hot product. Among IA products, PDA (Personal Digital Assistant) is getting popular and attracts a lot of manufacturers that hold the leading power in the network economy to participate in.

Looking from the nowadays science and technology development rapid situation, it is an unavoidable thing to use the scientific products to incorporate with teaching.

Making a comprehensive survey, the domains of the science and technology integrating the teaching in domestic and foreign are numerous. For example, the computer, internet network, dull and stereotyped computer, palmtop computer, projector, TV, record the shadow putting machine and radio-tape recorder have been applied on education.

Therefore, applying PDA to education is going to be expect. Because it will provide the pedagogue another kind of teaching auxiliary and then strengthen student's pluralistic contact and the application of science and technology. [6].

Consequently, the purpose of this research is to understand that case teacher promotes the course of teacher's teaching innovation with Personal Digital Assistant in order to offer the reference of teaching innovation to a teacher.

2. Development history of Personal Digital Assistant
The full name of PDA is Personal Digital Assistant, named by John Scully, the former Apple president, in January of 1992. PDA is one kind of the palmtop computer with smaller volume. Because of its price and practical value, everybody can accept. Therefore, it is considered as the star of the future scientific and technological products.

On the operating system of Personal Digital Assistant at present, there are mainly two major operating systems, Palm OS and WinCE. Because the issue of WinCE was later, Palm OS took the first chance in the market. Hence, the system of Palm OS has more occupation rate.

Though WinCE and Palm OS are all operating systems of Personal Digital Assistant, the hardware structure of WinCE and Palm OS is completely different. The hardware among two kinds of operating systems is incompatible each other. There are many support manufacturers of Palm OS at present, like IBM, SONY, HandEra, COMPAQ, Symbol. In addition, Palm produces PDA. PDA adopts Palm OS system in this thesis, its serial aircraft types are Palm Pilot families.

The founder of Palm Pilot is Jeff Hawkins. At the beginning of 1990, Jeff Hawkins served as a vice president at GriD companies and had finished GriDPad. Although its volume was big and the outward appearance did not look good, this is the first quite nice palm computer in the world.

Some big factories all think that this is the popular products in the future. In 1992, Jeff Hawkins founded Palm Computing Company, and joined with Casio Company to develop a Zoomer palmtop computer. In August of 1993, that Apple introduced Newton aircraft type is two months earlier than Zoomer, Hew-lett-Packard, Sharp. Therefore, it caused the Zoomer to become dull of sale. Besides, several individual assistants at the same moment sale out, their volumes are too large, and their prices are expensive, acceptance degree of the market is not high. The large factories do not reinvest the research and development of PDA in succession. Until 1996, Jeff Hawkins combined with Graffiti’s handwriting identification system, then he issued an first aircraft type of Taiwan Palm family - Pilot 1000 whose size is small and can put it in the pocket. Above all, its price is only 299 dollars and acceptance degree of the market is very high. While developing Pilot 1000, Palm Computing Company was selling U.S.Robotics. In 1997, 3COM Company merged U.S.Roboticses, and then Palm Computing has become a department of 3COM. In the spring of 1998, 3COM Company introduced Palm III aircraft type. The amazing thing happened, Palm III sold well and opened the market position of Palm Pilot from then on.

3 The definition of Personal Digital Assistant and overview of market

As the internet network service popularizes gradually, internet has already become indispensable part in daily life. Under the digitization, wide band of the network and interdynamic trend, the traditional consumption electronic product is bound with the computer and network gradually. Exchanging and dealing with the products of information can be called information household appliances [5] [11]. Generally speaking, the spirit of IA is cheap, convenient and easy to use. IA products depending on different applied environment can classify it for three kinds of application
environments, like network operation environment, entertainment media center for family user and individual motion news station for Individual user. User's markets of enterprises include net call (NC), windows-based terminal (WBT). The products of the home market include net TV, internet game console, set top box (STB) and screen phone. The portable product is the main product in individual market, including the palm on the computer, PDA, intelligent mobile phone, MP3 Walkman, formula of dressing PC and Web Pad.

According to IDC, the definitions of PDA products are: It does not have a keyboard appearance. It mainly deals with management of personal information. It is simple and easy to edit function. the product specification is that its weight is lighter than 1 Pound. Simply says, the products adopting the open or closed operating system can be called PDA. The products function of PDA are managed from the simple account to extend to the communication, like limitless communication field of receiving and dispatching email, surfing the Net. PDA can't be defined by the appearance and weight. In other words, this device offers several assistants of individual, then can be called PDA. U.S.A. is a main market of PDA at present and is estimated to occupy the global market about 70%.

There are Palm, Handspring, Compaq, HP, Casio, IBM and Sharp Sharp in international big factories of global PDA at present, and Taiwan has many companies that invests PDA in the manufacturing.

4 Kind and characteristic of Personal Digital Assistant

(2) Windows CE: Microsoft Company issued Windows CE operating system at the end of 1996, and go on the market matching the hardware every other year. Windows CE 3.0 is the edition of the mainstream on the market now. PDA carried Windows CE more than 3.0 edition, and referred to The specification of PDA in the market does not unify at present. In accordance with operating system, these PDAs may roughly be divided into five kinds:

(1) Palm OS : Using Palm OS as the operating system, this kind of PDA is called Palm. In 1996, Palm Computing Company issued the first PDA, named ' Palm Pilot '. The initial concept of Palm Pilot is to do summary of daily work. For example, arrange calendar, address book as well as memorandum, and duplicate the information to PIM in step ( Personal Information Manager ) [8].

as Pocket PC. Windows CE is Windows using the desktop computer, and becomes suitable for the operating system that PDA uses to improve. Besides function of PIM, Windows CE is the same as desktop computer, there are many worker's characteristics and file system [9]. On the user's angle, Pocket PC is a bikini computer, and has already jumped the category of taking off PIM in essence [10] [12].

(3) EPOC: EPOC is the hand-held device operating system, it is the highest in the European occupation rate. Except applying to PDA, mini computer and system of the mobile phone often use EPOC. The characteristics of EPOC operating system lie in its key technology including strong standard communication protocol and Java.

(4) Penbex: This operating system is from Taiwan (Penbex Data Systems, Inc.)

(5) Other: There are many manufacturers on the market at present. It will develop the electronic
product with some PDA functions by oneself, such as electronic dictionary, stock machine. This kind of products usually use operating systems which the manufacturer develops by oneself.

In domestic PDA market, Palm and Pocket PC own more than 90% occupation rate together. Just as spoken before, the initial design idea of Palm is to be designed with PIM function. Palm has used Motorola Dragon Ball central processing unit of slower pace (the pace is 16Mhz - 33Mhz), the memory has 4-8Mb, display device of most Palm have chosen 16 Liquid crystal screen of the gray steps, have characteristic of saving the electricity very much. In the software part, in order to cooperate with the hardware of Palm, there are some advantages like small, simple structure, and high optimization.

5 Comparison of Personal Digital Assistant and other products
Choosing the collection tool of the materials must consider several main points: (1) the characteristics of this tool should be light, small and portable. (2) the size of this tool should be big enough to display the graph. (3) this tool can transmit the materials with the desktop computer, and save the question of the construction materials again. Tablet PC is the synthesis of Notebook and PDA. The advantages of Tablet PC are high-speed handling capacity of Notebook, and humanized input. At present, Tablet PC is only suitable for moving. In addition, Tablet PC and Notebook are similar in the part of the power consumption that works not so good. Therefore, it will reduce its value of operation.

Sum up, Tablet PC has a bigger screen, fast operation ability, and has better behavior to handle the respect in the materials. But PDA has light and handy appearances, and can use for a long time. The two have used the interface that can be imported with the pen. Considering the advantage factors of this two, this research will chooses PDA as the tool of materials collecting and management.

6 Personal Digital Assistant application in education
In U.S.A. K12 Handhelds (2002) pointed out in websites, Personal Digital Assistant has many kinds of teaching methods in education, and is suitable for the project that Taiwan implements. List as follows, and offer the domestic researcher to consult:

(1) management application:
(a) Newer journey is noted down at any time.
(b) Follow the trail of student's progress in professional technique.
(c) Use the electronic calculator.
(d) Read or store student's information immediately, such as the planning chart, Demography.
(e) Plan one's own reading the booklist.
(f) Take notes at the meeting or in having a class.
(g) Record and do tabulation demonstration match
(h) Store and use the course project.
(i) Store and track students' IEPs.
(j) Track, sort out and control stock tabulation in the chemical laboratory and security information.

(2) Communication and cooperative application:
(a) Convey the E-mail.
(b) Convey or receive the fax.
7 Research approach

This research, according to the purpose of studying, probes into relevant literature, chooses six Nature and Science Technology teachers in primary school as the cases, takes Qualitative Research Methods as the core, matches Investigation Research Methods, conducts the research.

7.1 Implement the procedure: the procedure of this research is to probe into relevant literature first, and then select the case teacher to participate in studying. According to the need of studying, the experts and scholars will draft semi-structured
interviews outline and then carry on Focus Group Research. The case teacher employs the experience of Personal Digital Assistant actually, passes Focus Group Research, understands it and then utilizes Personal Digital Assistant to practice teaching.

7.2 Study tools:
7.2.1 Study the background of the case: There are six cases in this research, using Personal Digital Assistant at ordinary times, and applying to teaching. So, these six teachers are representative for this research.

7.2.2 Experts' Opinion target of the interview outline: This research is to set up Experts' Opinion of the interview outline, select experience and research Personal Digital Assistant.

8 Analysis and discussing
Via interview Text analysis, Narrate it as follows:

(1) The case teacher uses Personal Digital Assistant in initial stage, almost there is no help in the innovation of teaching.

The case teacher puts forward the following views:

I have thought of a new idea in the school, deal with the achievement that PDA applies to the class, the beginning when use, Because not that it is used very skillfully, sometimes even more bothersome than to bring the paper and write down ( AA01 ).

PDA prevails very much now, I study those scientific and technological upstarts, family and student all support very much, Cooperate and use in teaching activity even more, just the students all look forward to the new function of PDA very much, and I am often disappointing because of can not operate very much ( CC01 ).

(2) Because of the increase of teacher's use experience of the case, And then stimulate the innovation of teaching.

Embodiment:
I find PDA from the procedure of creating at network often, can apply to teaching, I myself am in the experiment at present, Teach students and try too, The result has not been verified yet ( BB02 ).

I will put forward one's own experience and gains in the relev-ant websites of PDA too once in a while, Hope that can utilize the mutual view on everybody, Have never expected that there are teachers that have unexpect-edly left some suggestions on me on websites, PDA becomes my new assistant of teaching ( DD03 ).

(3) Personal Digital Assistant applies to teaching, Not rare yet, The users have already utilized and promoted teaching to innovate.

Share the gains to Personal Digital Assistant on the case teacher, analyze that descriptings as follows:

Think that there should be different ideas, thinking that must be creative, so, everybody is using the experience of PDA, will discuss in the network, I once have no intention of finding to a website, the good hand enables and sharing diligently in covering with one above, let me learn it much ( FF03 ).

Utilize PDA to paint, record with the form of observing the plant of the open air of scientific and technological course of life naturally, teachers and students can share experience too, it is really interesting,
Students feel very fresh too (BB05).

(4) In the course of Personal Digital Assistant, besides innovating in teaching, lead the teacher to be exposed to and use science and technology, it is a fountainhead achieved in teaching even more.

The case teacher proposes the evidence is as follows:

The child who plays with science and technology is really very happy, we play with PDA by oneself, the children play with GameBoy, PDA, for them, it is not a thing very difficult to understand at all, PDA is very easy to accept for child, for that we work as a teacher, more simple and more convenient, there is the assisting of it, write down one grade of affair items of class every day, I would not forget (EE05).

Because of PDA, Let me welcomed in the school by students very much, they will say I hand-carry a mini computer, very serious oh. too because like this, My daily Notebook too, the products of single rifle projector, etc. come to assist teaching, Science and technology gives me much feeling of freshness and value, Become and looked for novelty the teacher of changes pursuing by me (BB04).

9 Conclusion

This research, according to the interview text analysis of six case teachers, Find it as follows:

(1) The case teacher is in initial stage of using Personal Digital Assistant, almost there is no help in the innovation of teaching.

(2) Because of the increase of teacher's use experience of the case, and then stimulate the innovation of teaching.

(3) Personal Digital Assistant applies to teaching, not already been rare, the users have already utilized and promoted teaching to innovate.

(4) In the course of Personal Digital Assistant, besides innovating in teaching, lead the teacher to be exposed to and use science and technology, it is a fountainhead innovated in teaching even more.

References:


from the World Wide Web:
http://info.med.yale.edu/caim/manual/index.html


