"Transforming Health Care II: The PDA at the Point-of-Care"

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Project Abstract

"Transforming Health Care II: The PDA at the Point-of-Care" is a pilot project funded by the University of Massachusetts President's Office Information Technology Council through their Professional Development Grant program in 2005. The project goal is to offer faculty and students in nursing programs at both UMass Boston and UMass Lowell access to an array of medical reference information, e.g., handbooks, dictionaries, calculators and diagnostic tools on small handheld personal digital assistant computers for use during their clinical rotations. Fifty PDAs, each loaded with a core selection of five databases, were made available to nursing faculty and students involved in nursing clinical assignments. Participating faculty were given a PDA for the academic year and classes of students were encouraged to borrow and use a PDA for the length of their six to fourteen week clinical rotations. The university library served as a public point of service for faculty and students to borrow and return PDAs as well as provided technical support in routine re-synching of handhelds and updating of information. The project is promoted through formal training sessions and written literature.

The Year in Review

In July the researchers met both in meetings and via audio-conference to discuss the purchase of the hardware and associated databases. 50 Palm ™ E2 handheld computers with six core databases were ordered from Skyscape Inc. and delivered to UMass Boston. Twenty-five PDAs were delivered to Lowell. By arrangement with Skyscape, all PDAs were delivered with all six databases loaded. Product registration was completed at campus which decreased set up time and work. Kafel, Scollin, and Welch reviewed and revised the questionnaire form originally created by Barbara Yoost, MSN, RN, CNS Kent State University College of Nursing and used with permission (copy attached).

By the end of August all 50 PDAs were configured and ready for the start of classes. Kafel and Welch had identified three sections of junior Adult Health (Med/surg) rotation. Boston's clinicals run for 14 weeks with 8 students per clinical group, while Lowell's usually run for 7 weeks with 6-8 students per clinical group. Scollin, along with two nurse colleagues identified the first and second clinical rotations for the fall semester. These included obstetrics, pediatrics, psych nursing and med/surg.

In early September, Boston distributed 24 PDAs to three clinical groups and invited Skyscape to campus to provide training. Lowell distributed 5 PDAs to nursing faculty for the academic year and twenty PDAs to students in designated clinical classes. Two nursing faculty undertook to instruct their peers in using PDAs while faculty and librarians provided orientation

to classes the first week of school. At the end of each clinical rotation at Lowell the students would return the PDAs to the library, where they would be serviced and made ready for the next clinical group. Boston's were only returned at the end of the clinical rotation or if a problem arose. At the end of each clinical rotation at Lowell and the end of semester in Boston students were asked to complete the questionnaire and return them to their clinical instructor. Students, at Boston, were asked weekly in class how they were using the PDA and if there were problems, comments, concerns. At both Boston and Lowell students in other sections of the same clinicals who did not have access to the PDA were also asked to complete the questionnaire.

Deliverables

PDA and chargers. Fifty Palm Tungsten E2s were bought, prepared, and maintained through the year with no losses. The Library at Lowell provided a small plastic box to contain the PDA and the charging unit. At each library a PC was designated as a synch station where Skyscape database updates could be loaded periodically onto the PDAs.

Databases: Six medical resources were purchased from Skyscape and loaded onto each PDA. PDAs were re-synched at the PC station on return to the library to restore missing information and software, check for hardware functionality, and recharge battery levels.

Library Staff Participation: Access services staff participated fully in the maintenance and secure storage of PDAs. At Boston a separate reserve room served well as a point of borrowing PDAs and at Lowell the main circulation/reserve desk relied on storage in an office safe to secure the PDAs not in circulation. At Boston the students were assigned a unit by their clinical instructor and used it for the duration of the clinical. At Lowell lists of students in the assigned clinicals were supplied to the Library and students borrowed PDAs as they might borrow a book at the circulation desk. Borrower records were maintained using the Endeavor Voyager library system.

Presentation: Three members of the project from Lowell were able to present the project's plan and progress at the 24th Annual International Nursing Computer/Technology Conference which was sponsored by Rutgers University and held in Toronto, Canada in May 2006. Professor Ainat Koren from Lowell also presented at Toronto on her research "Palm Perspectives: The Use of Personal Digital Assistants" as a poster. Drs Koren and Fisher have been two key nursing faculty at Lowell using the PDAs during clinical. Mr. Callahan and Dr. Scollin presented a poster on May 26th. Judith Walsh of UMass Boston has an abstract describing this study accepted as part of a panel presentation at the Biennial North American Learning Resource Centers Conference to be held in Philadelphia during June 16-18th, 2006. Lowell has submitted a proposal to present at "Cool Tools and New Technologies", the tenth annual October Conference for New England academic librarians, sponsored by the Dartmouth Biomedical Libraries in October 2006.

Publication: Based on the pilot project involving the same two campuses and funded by University of Massachusetts President's Office Information Technology Council through their Professional Development Grant program in 2004, the following article will be published in the

July/August issue of Computers, Informatics, Nursing, Scollin, P, Callahan, J., Mehta, A, Garcia, E. (2006). The PDA as a Reference Tool: The Libraries Role in Enhancing Nursing Education. Computers Informatics Nursing.24(4). The researchers intend to submit a second article based on this years project to the same journal.

Evaluation: As noted earlier both campuses used the same questionnaire to access student satisfaction with the PDAs. The results are presented below.

Budget: As of June 1, 2006, $**19,727.50** had been expended from ITC's initial allocation of $19,727.50.

Original award June 2004		$19,727.50
50 Palm Tungsten PDA w/ 5 Medical databases	$19,727.50	
Total		$19,727.50

Project Results: From September 1 to May 31, 2006 Boston had 78 loans and Lowell had 84. Boston supplied the PDAs to three clinical medical/surgical groups for a period of fourteen weeks each, both semesters. Lowell has a seven week clinical rotation and a fourteen week senior preceptorship. A major difference between Boston and Lowell was with the students. Boston choose to use the PDA with the junior level clinicals, while Lowell had both junior and senior clinicals. Many of the seniors had experienced the PDA from the previous years project, and many had acquired their own.

Questionnaire Results

Clinical Rotations

UMass Lowell	**UMass Boston**
7 Weeks ● Med/Surg ● Obstetrics ● Pediatrics ● Psychology ● Senior Internship – 14 weeks	**13 Weeks** ● Med/Surg

Student Demographics

UMass Lowell		**UMass Boston**	
● **Female**	**91%**	● **84%**	**Female**
● **19-25 yrs old**	**83%**	● **51%**	**19-25 yrs old**
● **Caucasian**	**89%**	● **76%**	**Caucasian**
● **High School Grad**	**76%**	● **62%**	**High School Grad**
● **Own PDA**	**48%**	● **20%**	**Own PDA**
● **Instructors have PDA**	**89%**	● **24%**	**Instructors have PDA**

Other resources used to find information by student's using PDAs

UMass Lowell		UMass Boston	
● **Reference Books**	**22%**	● **8%**	**Reference Books**
● **Internet**	**11%**	● **7%**	**Internet**
● **Staff Nurse**	**11%**	● **13%**	**Staff Nurse**
● **Clinical Instructor**	**20%**	● **13%**	**Clinical Instructor**

Frequency of use of PDA

UMass Lowell		UMass Boston	
● **1-3 times/day**	**22%**	● **40%**	**1-3 times/day**
● **4-6**	**39%**	● **33%**	
● **7-9**	**24%**	● **9%**	
● **10 or more**	**15.0%**	● **18%**	**10 or more**

Overall Satisfaction with PDA

UMass Lowell		UMass Boston	
● **Very Satisfied**	**85%**	● **75%**	**Very Satisfied**
● **Moderately**	**15%**	● **16%**	**Moderately**
		● **7%**	**Somewhat**
		● **2%**	**Not Satisfied**

Efficiency* of the PDA

*Efficiency – the capacity to bring about a desired result with little waste of time or energy (Webster's Dictionary)

UMass Lowell		UMass Boston	
● **Very Efficient**	**74%**	● **69%**	**Very Efficient**
● **Moderately**	**15%**	● **27%**	**Moderately**
● **Somewhat**	**6.5%**	● **2%**	**Somewhat**
● **Not Efficient**	**2%**	● **2%**	**Not Efficient**

Overall Satisfaction with PDA as a Learning Tool

UMass Lowell		UMass Boston	
● **Strongly Agree**	**76%**	● **48%**	**Strongly Agree**
● **Agree**	**15%**	● **4%**	**Agree**
● **Neutral**	**2%**	● **20%**	**Neutral**
● **Disagree**	**2%**	● **16%**	**Disagree**
		● **8%**	**Strongly Disagree**

Student Comments

UMass Lowell	UMass Boston
● "I liked how it was small and I could receive information very quickly."	● "It very user friendly and had an abundance of information in a

● "The PDA is useful where you need to access knowledge you don't already have – quick access is important in the clinical setting." ● "I liked the drug guide. It was very convenient and helpful." ● "It was very useful and easy to use."	convenient handheld spot." ● "There was a lot of information in the PDA that was condensed in a way that made it easy to learn and apply." ● "It was lighter to carry than the textbooks." ● "I liked having fast/easy access to medications and Taber's dictionary." ● "I enjoyed having multiple textbooks in one little space."

Note: Above data was presented at the 24th Annual International Nursing Computer/Technology Conference which was sponsored by Rutgers University and held in Toronto, Canada in May 2006.

Lessons Learned: The comparisons of the two campuses shows that differences in the perceived satisfaction and efficiency of the use of the PDA in clinical exist. Related to this are the differences in personal ownership and instructor use of the PDA during clinical. Lowell had faculty who were early to endorse and support the use of PDAs and acted as champions for the project, helping other faculty and encouraging student use daily. Without their help the project would not have been as successful. The importance of having such champions of an innovation can make the difference between the success or failure of the introduction of any new technology.

Collaboration between the two campuses turned out to be a dividend to the project investigators. While it proved very difficult to meet during the school year, meetings before and after the semester were positive and rewarding. The differences in the approaches and decisions each campus took toward employing PDAs in the respective clinical settings were more intriguing than had a strictly parallel plan been followed. Future collaborative ITC grants should be better fostered through additional funding, possibly graduated in release, and longer overall project time frame in recognition of the difficulties such efforts involve.

During the 2004 pilot project both campuses required the students to sign a loan agreement that they would be responsible for up to $1,000 in hardware and software if the PDA was broken or lost, which resulted in many students indicating they did not borrow a PDA since they could not afford to replace it. During the current project Boston reduced the replacement cost to the student to $300, Lowell did not impose any penalties for loss or breakage. Comments from students at the Boston campus show that they were concerned about the $300 they would be responsible for. Adding an additional burden to the use of the technology, such as the replacement cost, can act as a deterrent to the use of said technology. Neither campus suffered any loss of PDAs.

The desire for ownership by the students was again apparent during this project. Although the students could borrow the PDA for the entire clinical rotation many did not understand why they could not keep it and many did not want to return it at the end. This resulted in some of the students purchasing their own PDA and databases. The purpose of the

project was to afford the student to use this technology without having to incur the expense of personal ownership, but given the nature of the PDAs additional functionality to maintain a calendar, contacts, notes and task, it becomes more than just a source of reference information. For students who had purchased their own, the continuing cost of maintaining the databases(anywhere from $30-$50 a year will become a personal burden. The solution to this is to make the hardware and software available to all students as part their nursing program, but this will require additional funds that may not be available in the college or library budgets.

Next Steps: Over the past two projects it is apparent that the Library can serve as a point of support and service to students to borrow a handheld computer with medical/nursing databases that will afford them information at the point-of-care. Currently each campus has 35 PDAs that are still usable for at least another year or two before the technology moves further forward. Funding to maintain the current reference databases is needed now to continue the project. The cost of maintaining the current databases is approximately $250 per unit which will be sought from the individual campuses. Other sources of funding to increase the scope of the project will be sought from public and private funding sources. Ideally every student would have a PDA and associated databases, and at many schools of nursing PDA and databases are a requirement that is added onto the purchase of books, uniforms, etc., but for the students at Boston and Lowell this would be an additional burden that many could not afford. Finding other ways of making this technology available to all students in the nursing programs is the challenge for all UMass campuses.

The Use of Personal Digital Assistants in the Clinical Setting

Demographics

Please answer/circle the appropriate response to each of the following questions:

1) Are you male or female? Male Female

2) What is your age? A (19-25) B (26-31) C (32-38) D (38-44) E (45+) _____

3) What is your ethnic background? A) African American, Black B) Native American C) Asian American D) Hispanic, Latino E) Mexican American F) White or Caucasian G) other _____

4) What is the highest degree you have attained? A) High School B) Associates degree C) BA/BS D) MS/MA E) Doctorate _____

5) Do you own a Personal Digital Assistant? (PDA) Y N

6) Does your clinical Instructor use a PDA? Y N

7) Which of the following information sources did you utilize most frequently in the clinical setting? _____

A) Reference/text books
B) Internet
C) Staff nurses
D) Clinical Instructor
E) Personal Digital Assistant (PDA)

8) Approximately how often during a clinical day did you use this information source in the clinical setting? _____

A) 1-3 times
B) 4-6 times
C) 7-9 times
D) 10 or more times

9) How would you rate your overall satisfaction with this information source? _____

A) Very satisfied
B) Moderately satisfied
C) Somewhat satisfied
D) Not satisfied

10) How would you rate the efficiency* of the most frequently used learning tool? _____

A) Very efficient
B) Moderately efficient
C) Somewhat efficient
D) Not efficient

***Efficiency- the capacity to bring about a desired result with little waste of time or energy (Webster's Dictionary)**

The following questions are to be answered only by those students that were given access to PDAs during clinical.

Please evaluate the following statements on the scale identified below.
(1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree)

11) I feel that a PDA enhanced my learning.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

12) The PDA saved me time.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

13) I use the PDA more often than I would a reference book.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

14) I think using a PDA helps me to retain reference knowledge.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

15) I think using a PDA discourages me from memorizing required lab/medication information.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

16) I think using a PDA actually helps me to remember critical lab/medication information.

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

17) Overall I am very satisfied with the PDA as a learning tool for use in the clinical setting

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

18) After using the PDA in clinical would you consider purchasing your own? Y N

Giving specific examples please answer the following questions.

19) What did you like most about using the PDA?

20) What did you like least about using the PDA?

Comments:
Please comment on the nursing staff's reaction to the use of the PDA.

Please describe a situation that elicited a patient's response to the PDA

Above questionnaire developed and revised from an Evaluation of Student Use of PDAS in Nursing used with permission of Barbara Yoost, MSN, RN, CNS Kent State University College of Nursing. Kwk 8/05, PAS 9/05