2007

A framework of an effective online help system to support nurses using a nursing information system

Yiyu Qiu
University of Wollongong

A Framework of an effective online help system to support nurses using a nursing information system

A thesis submitted in fulfilment of the requirements for the award of the degree
Master of Information and Communication technology by Research

From

UNIVERSITY OF WOLLONGONG

By

Yiyu Qiu

Supervisor: Dr Ping Yu
Mr Richard Fleming

School of Information Systems and Technology

2007

Declaration

I, Yiyu Qiu, declare that this thesis, submitted in fulfillment of the requirements of the award of Master of Information and Communication Technology by research, in the School of Information Systems and Technology, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualification at any other academic institution.

Signature:_____

Date:_____

Acknowledgements

I feel deepest appreciation and gratitude to a number of people and organizations who have contributed to the research undertaking and thesis preparation in many forms. My thanks go to:

Firstly, my mentor, the principal supervisor Dr. Ping Yu, University of Wollongong, for her constant encouragement, guidance and insightful feedback during all these years of my study. I have gained from your profound knowledge of research methodology and academic writing during this study.

My industry support supervisor Mr. Richard Fleming, director of the Dementia Care Centre in the Hammond Care Group Services, who is also the owner of the CPAT software, for his enduring support to this study and contribution of the development of the CPAT Online Help;

All the participants from the Nursing School in the University of Wollongong and Hammond Care Group Services in the usability testing experiment and focus group discussion;

People who facilitated and organized the experiments and discussion in the study: Dr. Patrick Crookes and Ms. Joanne Joyce and staff in Nursing school in University of Wollongong for encouraging and recruiting their students to participate in the needs assessment experiment; Ms. Patricia Murdoch, Dementia Care Specialist in Hammond Care Group, for her organizing and facilitating the focus group discussion and usability testing of the CPAT Online Help;

Dr. Madeleine Cincotta and Ms. Priscilla Connor, for their generous help in editing and proof-reading the manuscript of my publications and thesis;

University of Wollongong, for its provision of stimulating environment and friendly colleagues and staff;

Most importantly, my parents, my parents in law, my siblings, and especially my husband Mr. Xiaodong Yang, for your enduring support and encouragement throughout the research, for your love, patience, and confidence in me all the time, sharing both the ups and downs of my study.

Abstract

Research Aim and Questions: This research aims to develop a quality framework of an effective Online Help System (OHS) for a Nursing Information System (NIS). This involves the identification of the criteria for an effective OHS. The research questions are what content, structure, functions and aesthetics this OHS should have. The research will also provide guidelines about how to evaluate the usability of an OHS.

To learn unfamiliar features or functions of a Nursing Information System (NIS), nurses need effective and efficient assistances. An OHS, which aims to bridge the gap between the complexity of a NIS and nurse-users' need for simplicity, is one effective solution. However, systematic research on the design and evaluation of an OHS is not common. There is a lack of a comprehensive quality framework that could provide guidance on the design and evaluation of an OHS for a NIS. As nurses are important healthcare workers, their acceptance and usage of a NIS is important for the improvement of quality of healthcare data, it is imperative to conduct this research with strong potential to impact on the adoption of NIS by nurses.

Research Methodology: Two phases of investigation were carried out. Guided by a grounded theory approach, we first proposed a quality framework of an effective OHS for a NIS. In order to prove the validity of this framework, an experiment was carried out in which an OHS for an authentic NIS (the Care Planning and Assessment Tool) was developed and evaluated. Various research methods were employed in collecting data, i.e. laboratory-based usability testing, focus group discussion and questionnaire survey.

Results: The proposed framework was consisted of the five criteria (i.e. content, structure, functionality, aesthetics, and usability. The CPAT Online Help was designed according to the results of the needs assessment and the forty-three guidelines that reflect the quality indicators in the framework. The results of the heuristic evaluation of the CPAT Online Help shows that the help system highly reflect on the proposed framework. The results of

the usability testing suggest that the usability of both online help and hard-copy help manual is similar (i.e. no significant group difference was found for the results of both laboratory testing and the answers to the user satisfactory survey between online help and hard-copy help manual). However, in the laboratory experiment, the overall performances of the participants who used the CPAT Online Help were obviously better than those of the participants who used the hardcopy user manual. In addition, the survey responses from the former were more positive than those from the latter.

Discussion and Conclusion: The proposed quality framework and their indicators were validated and supported by our research results and findings. Our research suggested that 1) nurse users' basic computer skills, knowledge about an NIS, knowledge about procedures of nursing documentation should be covered in an OHS; 2) function-oriented and task-oriented structure are the effective structures of an OHS; 3) table of contents, frequently ask questions, search engine and video demonstration are effective functions; 4) visual-effectiveness can facilitate a nurse-user's problem solving 5) the indicators of the usability of an OHS is the 5Es: effectiveness, efficiency, error-tolerance, engaging and ease of learning.

Publications Arising from the Research

1. Qiu Y., Yu P. (2007), "Heuristic Evaluation of an Online Help System for a E-health Application", Proceedings of 7th International Conference on Successes and Failures in Telehealth, Brisbane, Australia, published in *Special Supplement to the Journal of Telemedicine and Telecare*, Impact Factor: 0.75.

2. Qiu Y., Yu P. and Hyland P. (2007), "A Multi-method Approach to Assessing Health Information Systems End Users' Training Needs", in MedInfo2007 congress, Brisbane, Australia.

3. Qiu Y. and Yu P. (2006), "Nursing Information Systems—Applying Usability Testing to Assess the Training Needs for nursing students", in *Methods of Information in Medicine*, 46 (4): 416-419, Impact Factor: 0.97.

4. Qiu Y., Yu P. and Fleming R. (2006), "A Comparison of Nurses' Satisfaction with Online Help or Hardcopy User manuals to Facilitate Their Mastering and E-health Application", Proceedings of 6th International Conference on Successes and Failures in Telehealth, Brisbane, Australia, published in Special Supplement to *the Journal of Telemedicine and Telecare*, Impact Factor: 0.75.

5. Qiu Y. and Yu P. (2005), "A Study of Characteristics of Effective Online Help System to Facilitate Nurse Interacting with Nursing Information System", Health Informatics Conference 2005, Melbourne, Australia, HISA.

TABLE OF CONTENTS

List of Figures

List of Tables