UNIVERSITI TEKNOLOGI MARA

MOBILE PERSONALIZED ALZHEIMER'S DISEASE MODEL (PALM) FOR NON-PHARMACOLOGICAL THERAPY

ANIS HASLIZA ABU HASHIM

Thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy
(Information Technology and Quantitative Sciences)

Faculty of Computer and Mathematical Sciences

April 2021

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Anis Hasliza Binti Abu Hashim
Student I.D. No.	:	2011108467
Programme	:	Doctor of Philosophy (Information Technology and Quantitative Sciences) – CS990
Faculty	:	Faculty of Computer and Mathematical Sciences
Thesis Title	:	Mobile Personalized Alzheimer's Disease Model (PALM) For Non-Pharmacological Therapy
Signature of Student	:	.....
Date	:	April 2021

ABSTRACT

The growth of aging population is increasing rapidly together with the average of life expectancy and also contributed to aging-associated diseases. One of the common diseases among older people is Alzheimer's disease. Alzheimer's disease has no cure, and people who suffer from the disease have difficulties to remember and carry out daily activities. Computer technology has shown a possibility rehabilitative role in Non-pharmacological treatment for Alzheimer's patients. However, the strategies and methods could be improved by having a platform that could assist people with Alzheimer's disease in their therapy sessions. The main objective of this research is to propose a mobile personalized non-pharmacological therapy model that is used to enhance memory and stimulate cognitive function of Alzheimer's disease patients. The first phase is to identify the issue of research area by using qualitative approach to understand the components used in personalized non-pharmacological therapies. The second phase aims to design and develop the proposed model, Personalized Alzheimer's Disease Memory Book, that later will be used to construct a mobile personalized digital memory book application for Alzheimer's disease. The third phase goal is to validate the proposed model with the experts. The design model was reviewed by 7 experts, with 4 experts in clinical and 3 experts in human computer interface. All of them have more than 10 years of experience in their fields. A design research methodology was adopted to ensure the successful of this research. It comprised of three phases; (i) problem formulation, (ii) design and develop, and (iii) evaluation. The instrument for model evaluation was constructed and distributed during semi-interview sessions with the experts. Two sets of questionnaires were involved, one set is for clinical experts and the other is for human computer interface experts. Usefulness and functionality were the areas being evaluated and validated by the experts to put forward the conclusions. Descriptive analyses, thematic analysis and Kappa coefficient methods were utilized in the analysis process. The findings in descriptive analysis revealed high agreement on the usability, functionality, approach as well as concept of the model and the application to assist Alzheimer's disease patients to improve their memory and strengthen their cognitive function. This study has shown that the model is able to help enhancing patient's wellbeing as well as encourage social interaction and communication with caretakers and family members. Experts believe that Personalized Alzheimer's Disease Memory Book model and personalized digital memory book application for Alzheimer's disease are the practical contributions to the body of knowledge. Besides that, the development of the application in this study has added to the increasing number of mobile application for Alzheimer's disease that can be used in therapy session.

ACKNOWLEDGEMENT

This thesis becomes a reality with the kind support and help of many individuals. I would like to extend my sincere thanks to all of them.

Praise to the God, the Almighty, for His grace, mercy and blessing bestowed upon me, has given me the strength to continue this challenging and inspiring journey until the end, which has made me who I am and brought me to where I am today.

It is a genuine pleasure to express my deep sense of thanks and gratitude to my supervisor, Dr. Marina Ismail, for her guidance, courage, support and friendship that was offered to me throughout the completion of my research. I am greatly indebted for all the hours she spent in guiding me, reading and commenting my writings. I appreciate her experience and expertise that she has shared with me, which has helped me in completing this research.

I would also like to express my special thanks to both my second supervisors, Dr. Ponnusamy Subramaniam and Professor Dr. Azlinah Mohamed, and not to forget Dr. Riaza Perveen binti Mohd. Rias, for all the supports, ideas and valuable advise that helped me throughout this journey.

I am extremely grateful to my dear husband, Mr. Eelco de Vries, and my parents, Mr. Abu Hashim Endut and Mrs. Zahiran Suhid for their love, prayers and constant encouragement throughout my research period. Also I express my thanks to my lovely daughters, Jadzia Mahyom de Vries and Maya Willemina de Vries, my brothers and sister in laws for their supports and prayers. My special thanks goes to my family members and friends (you know who you are), who were always there for me through good and bad times, thank you very much.

Thank you for everything.

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