

Simulated Electronic Health documentation: what influence nursing students' intention to use?

Chan Kim Geok, Saloma Pawi, Ong Mei Fong, Yanika Kowitlawakul, Goy Siew Ching,
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Introduction

- ▶ **Electronic health record systems** have been implemented in healthcare organizations in the last decade;
- ▶ **Nurses** navigate electronic health record system related to patient history, nursing assessment and interventions, progress notes, vital signs, intakes-outputs, incident reports, physicians' orders etc.

- ▶ Accuracy and proficiency in data entry process by nurses are vital to enhance patient safety and outcomes.
- ▶ **The use of advance technology** cannot improve organization performance if it is not accepted and utilized efficiently by the end users (Davis, Bagozzi, & Warshaw, 1989).

- ▶ Preparation of students as the future professional nurses who would accept and utilize the electronic health record system proficiently for a safe delivery of healthcare practice is imperative (Davis, et al, 1989).

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- Students' practice for documenting patients' health history, assessment, nursing progress notes, interventions, vital signs or intakes-outputs are inadequate and prominently **paper-based**.
- **Clinical practicum**, there is hardly any opportunity for them to practice health documentation, in particular electronically

- ▶ **A simulated, functional electronic health record application for students to navigate the technology, document and plan patient care in a simulated format in the clinical skill laboratory is essential (Gardner & Jones, 2012).**

Integrated Nursing Education System (iNES)

A simulated electronic health documentation, web-based application (<https://www.ines.sg>) from the National University Singapore (NUS) (Kowitlawakul, 2014) - accessible to students in the Department of Nursing of UNIMAS for teaching-learning purpose in 2015 via MOA.

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INES - Integrated Nursing Education System

Welcome to INES. Please Log In.



Alice Lee Centre for Nursing Studies

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▶ **MDJ 2133** Health Assessment

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▶ **MDJ3272-1** Paediatric Nursing(new)

Patient Name : Tan Lili || Patient IC : S1234567G || Ward No. : 5 || Bed No. : 6 || Allergies : Nil ||

Admission ▾ **Nursing Assessment ▾** Nursing Interventions ▾ Additional Forms Nursing Notes Patient Report

Gastrointe

- Neurological
- Respiratory
- Cardiovascular
- Gastrointestinal
- Urinary
- Reproductive
- Musculoskeletal
- Integumentary(Skin)and Incision
- Head and Neck
- Eyes and Ears
- Psychosocial

Gastric

Yes

No

Stool

Liquid

continent

WNL

Stool C

Black

own

Other

Patient Name : Mr. Kuro Raii || Patient IC : 901001015010 || Ward No. : 2 || Bed No. : 22 || Allergies : - ||





Patient Record Report

Demographical Data

Patient Name*:	Mr. Kuro Raii
Patient NRIC*:	901001015010
Ward Number*:	2
Bed Number*:	22
Allergies*:	-
Address:	
Phone:	
Gender:	Male
Marital Status:	Single
Birth Date:	Mon, October 01, 1990
Place of Birth:	
Ethnic Background:	Malay

Patient Medication Form

Patient Name: Tan Lili
 Gender: Male
 Ward Number: 5
 Bed Number: 4
 Module Code: NUR3111
 Status: Not Released

All Oral/Non-Parenteral Parenteral Fluid Infusion Nebulising Med Blood Product Sliding Scale												
Serving Date/Time	Route	Medication ↕	Dosage Regimen	Pick	Status	Given Date	Given Time	Pre-meal	Remark	Type	Edit	Delete
22/04/2014 08:00	Oral	Panadol	100mg	Not Pick	Not Given			Yes		Oral/Non-Parenteral		
22/04/2014 16:00	Oral	Panadol	100mg	Not Pick	Not Given			Yes		Oral/Non-Parenteral		

- ▶ **Study aims:** to examine UNIMAS nursing students' perceptions, attitudes, intention to use iNES and factors influencing their intention to use the web-application iNES.
- ▶ **Conceptual framework:** the Technology Acceptance Model (TAM) which explains causal relationship between variables on perceptions of ease of use, usefulness, attitude and intention to use (Kowitlawakul, 2011; 2008);

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Technology Acceptance Model

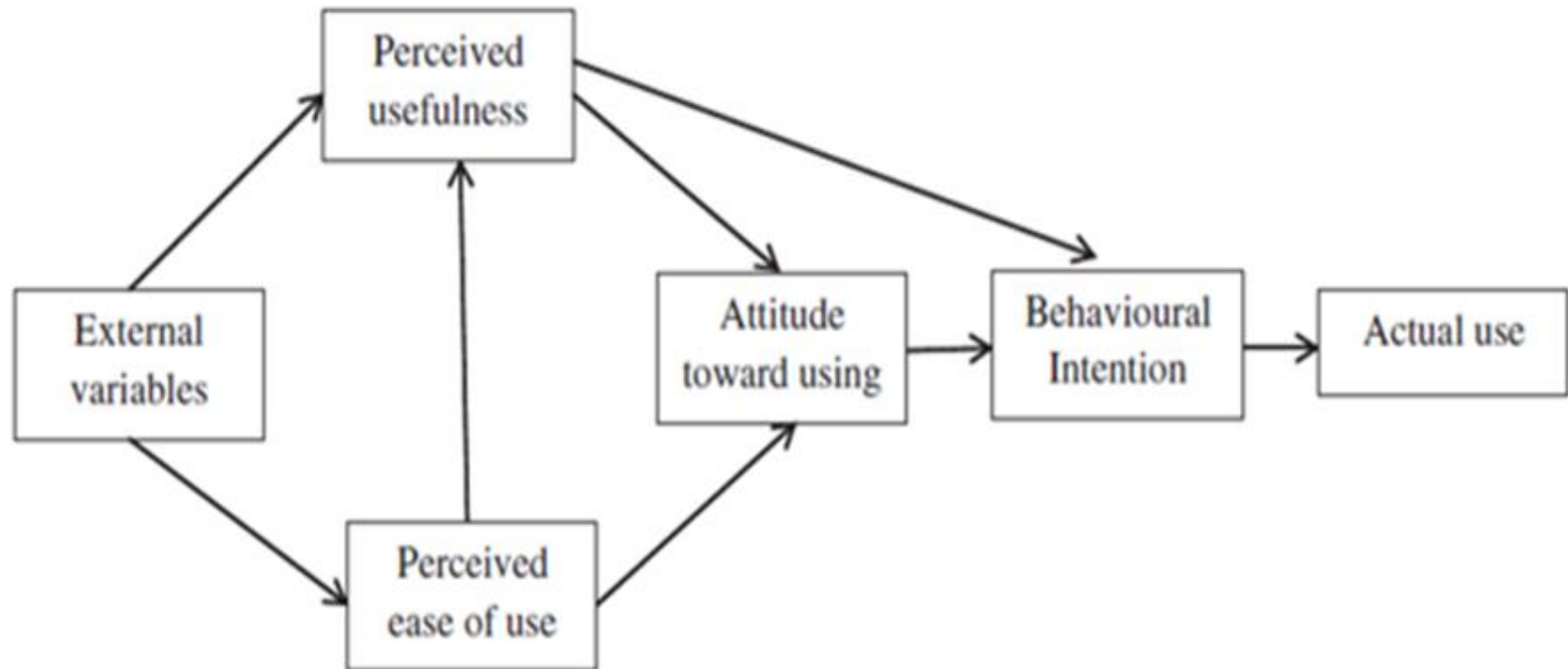


Fig. 1. The original Technology Acceptance Model (Davis et al, 1989).

Methodology:

- ▶ Population/Sample: year 2 to 4 nursing students in the Faculty of Medicine and Health Sciences;
- ▶ Ethics: Prior institutional ethic approval obtained with informed consent from participants for study;

Procedure:

- (I) **At the beginning of the academic year 2015/2016:**
 - ▶ students were introduced and guided to access iNES;
 - ▶ Course coordinators instructed students to access iNES to practice electronic documentation during the health assessment skill lab sessions, for case study and nursing progress notes.
 - ▶ Not given any extra marks for their participation;

(II) At the end of the semester:

- ▶ survey was conducted among 133 nursing students;
- ▶ Questionnaire: 5-points Likert's - strongly disagree to strongly agree; min=1; max=5) (Kowitlawakul, 2011; 2008)

○ Variables and items:

- *Perceived usefulness (7);*
- *Perceived ease of use (6)*
- *students' attitude (20)*
- *Intention to use iNES (6)*

Note:

As part of the study, focus group discussions were also conducted to explore students' experience of using the electronic documentation using the iNES with 6 groups of 8 students each. *This paper will focus on the survey findings related to perceptions, attitude and intention to use iNES.*

Data analysis

- ▶ Descriptive and compare means of different variables using SPSS (ver. 19.0);
- ▶ Structural equation modelling using AMOS (ver. 23) to establish the fitness of the measurement model and to examine the causal relationship among the latent variables (perceived ease of use, usefulness; attitude and intention to use.)

Results:

Background information (N=133)	n (%)
Age of students (yrs)	Mean=22.30; SD=1.53
Years of using PC	Mean=10.29; SD= 3.88
Years of study:	
Year 2	49(36.8)
Year 3	35(26.3)
Year 4	49(36.8)
Gender:	
Male	21(15.8)
Female	112(84.2)

perceptions, attitude and intention to use iNES (N=133)	Mean (SD):	
Perceived usefulness	3.28(SD=0.57)	
Perceived ease of use	3.06(SD=0.60)	
Attitude toward iNES	3.0 (SD=0.29)	
Intention to use iNES	3.12(SD=0.57)	

		n (%)	Intention to use mean (SD)	Test and significance
Gender	Male	21(15.8)	3.21(0.38)	t=0.48; p ^a =0.50
	Female	112 (84.2)	3.16 (0.35)	
Year of study	Year 2	49 (36.8)	3.30 (0.44)	F=3.94; P^b=0.02
	Year 3	35 (26.3)	2.90 (0.69)	
	Year 4	49(36.8)	3.10 (0.53)	
Years of experience using computer	< 5 years	12(9.0)	3.21 (0.50)	F=0.75; p ^b =0.56
	6-10 years	71(53.4)	3.18 (0.53)	
	11-15 years	36 (27.1)	3.04 (0.64)	
	> 15 years	10 (7.5)	2.92(0.64)	

^a Independent t-test for two samples; ^b One-way analysis of variance

Structural Equation Modelling results

Construct	Estimate	Standardised Estimate	S.E.	C.R.	p-value
Usefulness ← ease of use	.732	.856	.108	6.802	0.000
Attitude ← ease of use	.159	.197	.141	1.129	0.065
Attitude ← usefulness	.348	.370	.165	2.109	0.009
Intention ← attitude	.233	.221	.117	1.987	0.012
Intention ← usefulness	.471	.475	.118	3.995	0.000

Discussion

- ▶ due to the fact that the web-application iNES has been developed by the NUS, at times when there was instability of the web application, the local university IT staff was unable to trouble shoot the problem.
- ▶ This could have influenced students' perceived ease of use and usefulness, attitude and intention to use, though they have the computer self - efficacy.
- ▶ Findings provide useful insights into the future plan in relation to integrating electronic health records experience into the nursing education.

- ▶ The **University management's** support and allocation of resources to develop locally a user-friendly, simulated educational web application with accessible IT support;
- ▶ adequate **tutorials & explanation** given to students objectively - would positively influence students' intention to use new educational technology.
- ▶ **Nursing faculty** - integrate use of electronic health documentation into related courses with allocation of marks to students for their participation as incentives.

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REFERENCES

Baillie, L., Chadwick, S., Mann, R., Brooke-Read, M. (2012). Students' experiences of electronic health records in practice. *British Journal of Nursing*, vol. 21(21). Pp.1262-1269.

Bowers, A.M., Kawanagh, J., Gregorich, T., Shumway, J., Campbell, Y., Stafford, S. (2011). Student nurses and the electronic medical record: a partnership of academia and health care. *Computers, Informatics, Nursing*. Dec. 29(12): 692-97.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003.

Fornell, C., and Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research* (18:1), pp. 39-50.

Acknowledgment



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