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The roles of 'subjective computer training' and management support in the use of computers in community health centres

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ABSTRACT

There have been many changes made to information systems in the last decade. Changes in information systems require users constantly to update their computer knowledge and skills. Computer training is a critical issue for any user because it offers them considerable new skills. The purpose of this study was to measure the effects of 'subjective computer training' and management support on attitudes to computers, computer anxiety and subjective norms to use computers. The data were collected from community health centre staff.

The results of the study showed that health staff trained in computer use had more favourable attitudes to computers, less computer anxiety and more awareness of others' expectations about computer use than untrained users. However, there was no relationship between management support and computer attitude, computer anxiety or subjective norms. Lack of computer training for the majority of healthcare staff confirmed the need for more attention to this issue, particularly in health centres.

Keywords: computer anxiety, computer attitude, computer training, management support, subjective computer training, subjective norms

Introduction

Studies have identified computer training as one of the factors that influence the success of users of computer systems.[1,2] Davis and Bostrom state that the responsibility given to users is an important issue in organisations, and user training is a key factor for organisational success in computer use.[3] Other studies have found that computer training and management support are important factors that should be considered because they can provide opportunities for users to participate in the process of information system development and successful performance, especially in areas such as health, which previously had been largely neglected in such studies.[4–6] The results of this current study should assess whether community health services, hospitals and other health organisations would function more efficiently, and thus deliver better service to patients and clients, by using computerised information systems.

Definition of training and computer training

There is no explicit definition in the literature of 'computer training'. After review of the literature and examination of the various different perspectives, 'subjective computer training' is defined by the researchers as:

- sensations and judgements of users regarding the process and product of a particular computer training activity

- the internal feelings of users about computer teaching and use
- thoughts, perceptions and emotions of users about the process of obtaining knowledge and skills in using computers.

Subjective computer training is the perceptions of users in relation to their computer training that only they can explain. The subjective training of individuals differs according to whether the training is successful or not and it can evince different perceptions from users. Some of these, such as positive and favourable perception of computer training, can increase confidence in users, making them more successful in their tasks and possibly also making them more enthusiastic about interacting with computers.[7] Positive feelings towards computer training occur also when the process is successful. A person who is able to achieve success is more likely to achieve further success.[8] However, people with a negative perception of computer training are more likely to avoid learning about, and working with, computers.

Hypotheses

Computer training is positively related to computer attitude

Kappelman and Guynes, and Schiffman *et al* found that users' computer training positively affected their attitude towards computers.[6,9] The importance of computer training in inducing positive attitudes to computers has been established by several studies.[10,11] Igbaria, in a study on effectiveness of user computing, argued that users' attitudes toward computers were significantly affected by computer training.[12] The user with computer training had a more favourable attitude towards computers and they tended to learn how to use computer systems easily, but the user with negative attitudes had difficulties in the learning process.

Computer training is negatively related to computer anxiety

Inadequate computer training can produce anxiety towards computers for users. Robertson *et al* reported in their study that teachers had greater computer anxiety than students.[13] The researchers concluded that one of the reasons for this was that the teachers themselves were not adequately prepared and trained to use computers. In another survey, Igbaria reported that computer training had strong effects on computer anxiety.[11] At the start of computer training, users might well be anxious, and computing skills gained from the training course can help them to overcome this by enabling them to work or study harder and practise more.[14]

Computer training is also a quick and inexpensive way to decrease computer anxiety.[15] Moreover, Igbaria pointed out that the computer anxiety of the user was significantly affected by their computer training; those with more training had less anxiety.[12] In a parallel study, Torkzadeh and Angulo reported that computer anxiety is a real problem for new computer users, but they can be successful in their tasks if they are able to accept computers.[16]

Computer training is positively related to subjective norms

Subjective norms are defined as a person's belief that specific individuals or groups think that person should/should not perform a particular behaviour.[17] By focusing on subjective norms, the influence of superiors and the expectations of managers regarding computer systems would be studied. Since there are only a few studies examining computer training and its effects on subjective norms specific to health, the role of computer training on subjective norms is not clear and more studies are required.[18,19]

Management support (general support and information centre support) is positively related to computer attitude

Management support can improve communication between users and the management structure in an organisation. Exploration, communication and channels for supporting users are important factors that should be considered in management information systems. To increase the effective use of computerised systems, management support is crucial because it can positively affect users' attitudes towards, and acceptance and use of, computerised systems. Management support plays an important role in establishing positive attitudes among computer users in organisations; Schiffman *et al* reported that it was positively related to users' attitudes toward computers.[9,12] Other studies reported that information centre (IC) support had both positive direct and indirect effects on users' attitudes.[10,11] However, Kleintop *et al* in their study noted that management support did not affect users' attitudes before implementation.[20] The need for research on management support and its effects on users' attitudes was emphasised by a number of studies.[9,21,22]

Management support (general support and information centre support) is negatively related to computer anxiety

Studies have shown that there is a negative relationship between user computer anxiety and management support. In his study on user acceptance of computer technology, Igbaria reported that IC support had both negative direct and indirect effects on computer anxiety. Consequently, users with IC support had less computer anxiety than those without support. The author concluded that IC and management supports are predictors for lower computer anxiety. In another study by Igbaria, it was again found that computer anxiety was significantly reduced by IC support.[12]

Management support (general support and information centre support) is positively related to subjective norms

Management support can improve co-operation and favourable communication in organisations and can modify intention toward positive behaviour.[23] There are few studies about the relationship between management support and subjective norms in management information system (MIS) studies. Songer-Nocks reported, from a study in an unrelated field, that normative beliefs had a significant weight under co-operative conditions.[24] Therefore, management support can influence subjective norms.

Method

Instruments for measuring variables

For measuring subjective computer training the Subjective Computer Training Scale (SCTS), developed by Yaghmaie, was used.[25] Content validity and discriminant validity were measured. To measure reliability, coefficient alpha was calculated for five items of the scale. The Cronbach alpha coefficient was 0.85.

Regarding the measuring of management support, Igbaria developed a scale that contains two broad categories of support: (i) the presence of an information centre and the availability of development assistance, and (ii) general support (management support) which includes top management encouragement, allocation of resources and MIS staff support.[12] The scale contains eight items, four items for each subscale. The internal consistency of the scale in this study was 0.81.

For measuring computer attitude, Jayasuriya *et al* developed the Nurses' Computer Attitudes Inventory (NCATT), with 22 items ranging from 'strongly agree' to 'strongly disagree'.[26] The NCATT has three factors: (i) patient care, (ii) computer anxiety, and (iii) patient confidentiality.[27] The internal consistency and reliability of the scale in this study was 0.90.

To measure subjective norms, Hebert developed a scale with items regarding peers, nursing managers, directors of nursing, professional associations and union memberships.[28] It is a five-point Likert scale, ranging from 'strongly agree' to 'strongly disagree'. In the current study this scale was used to assess subjective norms. The internal consistency and reliability of the scale in this study was 0.82.

Sample and data collection

The data were collected by mailing questionnaires (see Appendix 1) to 430 health workers employed in community health centres in a local area; we asked that they be completed by every staff member (nurses and health workers).

Results

The response rate for completed questionnaires was 302, 70% of the total number mailed out.

Table 1 shows that of 302 respondents, only 112 (37.1%) had had computer training, and the remaining 190 (62.9%) had not attended any computer training courses.

Table 1: Frequency of computer training courses undertaken by participants

Computer training	Frequency	Percent
Yes	112	37.1
No	190	62.9
Total	302	100.0

There was a significant difference in level of computer training on computer attitude, F (1, 109) = 9.15, $P = 0.003$ (Table 2). The users with higher levels of computer training had more positive attitudes towards computers (M = 3.721) than those with lower levels of computer training (M = 3.450). Moreover,

Table 2 ANOVA – univariate F-test for computer training on computer attitude, computer anxiety and subjective norms

Variables	DF	MS	F	Sig
Computer attitude	1, 109	2.02643	9.15493	0.003
Computer anxiety	1, 110	6.24525	15.64878	0.000
Subjective norms	1, 109	3.42767	11.08505	0.001

DF degrees of freedom; MS mean square; F Fisher test; Sig significance

there was a significant difference between levels of computer training and computer anxiety, F (1, 110) = 15.64, $P = 0.000$. The participants with higher levels of computer training had lower levels of computer anxiety (M = 1.904). On the other hand, the participants with less computer training showed higher levels of anxiety (M = 2.378). The results also indicated that there was a significant difference between computer training and subjective norms, F (1, 109) = 11.08, $P = 0.001$. The participants with higher levels of computer training paid more attention to others' expectations (M = 3.594) than the participants with lower levels of computer training (M = 3.242).

However, there were no significant differences in management support on computer attitude, F (2, 242) = 0.984, $P = 0.375$; computer anxiety, F (2, 243) = 0.977, $P = 0.378$; and subjective norms to use computers, F (2, 242) = 1.226, $P = 0.295$. Moreover, there were no significant differences in general support on computer attitude, F (2, 243) = 0.737, $P = 0.479$, and on computer anxiety, F (2, 243) = 0.188, $P = 0.829$. However, there was a significant difference in general support on subjective norms, F (2, 242) = 7.118, $P = 0.001$. The result also showed that there was no significant difference in IC support on computer attitude, F (2, 242) = 0.382, $P = 0.683$; computer anxiety, F (2, 243) = 0.256, $P = 0.774$; and subjective norms to use computers, F (2, 242) = 0.391, $P = 0.677$.

Discussion

In spite of the emphases of studies on computer training, the majority (62.9%) of the participants in health sectors in this study had not received any computer training. These results are consistent with Nabali's study, which reported that only a small number of hospital staff had computer training.[29] It seems that more effort needs to be focused on computer training, and health organisations need to give high priority to training programmes for their users. This study confirms the important role of computer training in influencing the user's attitude, subjective norms and anxiety. Thus, it should be based on the user's level of knowledge and requirements of their role and tasks.[12]

The high levels of computer knowledge and skills among health staff in this study produced evidence of favourable attitudes to computers. The computer training–computer anxiety results are consistent with the results of the other studies that showed that trained users had less computer anxiety.[11,13] Offering computer training with carefully selected content can lead to positive feelings for the participants that they can control their computer interactions. Therefore, users should be trained, especially for new computer systems and software, until they feel comfortable using them.

The results of the present study also indicate a significant effect of computer training on subjective norms to use computers. Users with more computer training paid more attention to the organisational policies and others' expectations for computer use. This result supports the importance of computer training as part of the information system (IS) manager's task, in order to improve the relationships between users, managers and other staff.

Management support can influence the promotion of usage of computerised systems by offering substantial educational programmes. Managers or key persons who strongly influence the environment are most likely to have a great impact on the user's belief in the system's benefits. Therefore, to promote the effective use of computer technology in the long term, organisations need to positively influence users' perceptions and beliefs regarding the benefits of computerised system usage in the workplace. Management can affect this approach by encouraging, showing an interest in, and being aware of the problems of their staff.

This study did not find a significant correlation between management support and users' computer attitudes. This finding is inconsistent with the study of Lucas, who found a positive relationship between management support and computer attitude (though not in the health sector).[30] Mills and McQueen

reported that organisational support affected system usage in the health sector.[31] The authors explained that for more sophisticated users, there is a need for active support from management in order to assist them to develop a high level of skills.

The present findings also failed to find any significant difference between management support, computer anxiety and subjective norms to use computers. We postulate that IS has a strong base and a clear role in the fields of management and business, but is a relatively new area in the health sector; therefore, for better system usage, management support should be introduced and improved in the health sector.

Contrary to the research hypotheses, the general support of the health community centres did not show any significant difference in computer attitude and computer anxiety of the participants. On the other hand, the finding of this study was able to enhance the importance of general support in subjective norm to use computers. The research confirms that general support affected system usage based on others' expectations. Therefore, managers need to establish a supportive communication with their users.

The role of IC support is to help and encourage users to utilise the system and also to develop a wide selection of different types of useful software tools. Furthermore, information centres can provide appropriate educational programmes to support a wide variety of tasks. IC support can enhance positive computer attitude so it has direct effects on behavioural intentions via computer attitude. Therefore, use of an IC is a necessary part to build potential usage and acceptance of system usage in the long term. Since the user's perspective in this regard is important, IC management needs to encourage users to have a positive perception regarding IC and computerised systems. The importance of management support has also been widely recognised by a number of studies.[10,11]

The IC support and computer attitude related results are partially consistent with the study of Nord and Nord, who found that roughly 50% of the respondents reported that their company did not maintain an IC and only half of the respondents that had an IC felt that its assistance was adequate.[32]

Immediate system usage would be possible with good IS management support. Managers should make resources available in an IC, such as professional staff to provide assistance and hardware and software designed to support users in their jobs. Moreover, IC resources should be equitably received by users.

In general, the findings emphasise the important effects of computer training on health staff's attitudes, anxiety and subjective norms to use computers. By providing computer training, which is tailored to the demands of the user's workplace and management support, positive beliefs and ultimately effective computer usage will be provided.

Measuring subjective norms and subjective computer training are other strengths in this study because they play important roles in computer system usage. Therefore, it is critically important for health users to understand that subjective computer training and organisational policies are in place to ensure that the computerised systems are used effectively and efficiently. Many of the findings and arguments regarding subjective computer training and social pressure or others' expectations that are developed by this study are appropriate for organisations in general.

The most significant finding of the study is that no research has addressed empirically the linkage between subjective computer training, computer attitude and subjective norms. This study explored some empirical evidence. To understand information system success at the level of the user, it is vital to consider the psychological aspect, and measuring subjective computer training can provide this opportunity for managers.[6] Therefore, IS managers can utilise the SCTS to assess the current level of users' perspectives toward computer training to take action that would predict the level of system usage in organisations; and by correctly using it in studies, researchers can refine their understanding of the critical factors leading to MIS effectiveness and make future improvements.

Based on the training-related finding, this study suggests that computer training can reduce computer anxiety. The type of training in this regard is an important factor.[33] Therefore, additional research is needed to find how training can reduce the duration (temporary and permanent) or intensity of computer anxiety. Also, specifying the exact nature of computer anxiety should be made high priority for determining whether and how it can be alleviated by computer training.

Other empirical investigations are necessary to find the role of IS managers and the IC in the health sector. These may address many questions on how or why they use particular interventions. Organisations that have not developed computerised systems but wish to do so might consider these results as an appropriate step in assisting staff to perform effectively.

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CONFLICTS OF INTEREST

None.

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Appendix 1

Questionnaire used in the study

SA = Strongly agree	A = Agree	U = Uncertain	D = Disagree	SD = Strongly disagree

	Management support	**SA**	**A**	**U**	**D**	**SD**
1	Management understands the benefits to be achieved with the use of computers.					
2	There is always a person in the organisation to whom we can turn for help in solving problems with the computers.					
3	A central support (e.g. information centre) is available to help with problems.					
4	Training courses are readily available for us to improve ourselves in the use of computers.					
5	I am always supported and encouraged by my boss to use computers in the performance of my job.					
6	Management has provided most of the necessary help and resources to achieve rapid familiarity with computers.					
7	We are constantly updated on new software that can help us use the computers more effectively.					
8	Our satisfied usage of computers is of high interest to management.					

	Subjective norms	**SA**	**A**	**U**	**D**	**SD**
1	My co-workers think that I should use computers in my job.					
2	My nursing manager thinks that I should use computers in my job.					
3	My director of nursing thinks that I should use computers in my job.					
4	With respect to the nursing unit, I want to do what my co-workers think I should do.					
5	With respect to the nursing unit, I want to do what my nursing manager thinks I should do.					
6	With respect to the nursing unit, I want to do what my director of nursing thinks I should do.					

	Computer training	**SA**	**A**	**U**	**D**	**SD**
1	The number of computer courses that I have completed was necessary.					
2	The number of hours on computer course/courses that I have completed was necessary.					
3	The course/courses have increased my computer knowledge.					
4	The course/courses have increased my computer skills.					
5	In general, I am satisfied with the content of the computer course/courses.					

	Computer attitudes	**SA**	**A**	**U**	**D**	**SD**
1	The use of computers improves patient care by giving the nurse more time with the patients.					
2	Confidentiality is nearly impossible if patient records are in computers.					
3	Computer systems can be adapted to assist nurses in many aspects of patient care.					
4	It takes as much effort to maintain patient records in computers as it does by hand.					

continued

		SA	A	U	D	SD
5	I am comfortable using computers.					
6	A computer increases costs by increasing the nurse's workload.					
7	Computers create more problems than they solve in nursing practice.					
8	The use of computers dehumanises nursing care.					
9	Working with a computer would make me very nervous.					
10	Confidentiality will not be sacrificed by patient records being computerised.					
11	Part of the increase in costs of health care is because of computers.					
12	The time spent using a computer is out of proportion to the benefits.					
13	Computers represent a violation of patient privacy.					
14	Computerisation of nursing data offers nurses a remarkable opportunity to improve patient care.					
15	Computers make nurses' jobs easier.					
16	Nursing data does not lend itself to computerisation.					
17	I do not feel threatened when others talk about computers.					
18	Computers do not scare me at all.					
19	I feel aggressive and hostile toward computers.					
20	Computers cause nurses to give less time to quality patient care.					
21	Computers make me feel uneasy and confused.					
22	I have a lot of self-confidence when it comes to working with computers.					