

Dental Nurse Perceptions of an e-Learning Strategy at a Bangkok Hospital

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Abstract

Introduction. The perceptions of dental nursing staff relating to the issues affecting the development and use of an e-Learning strategy of a private hospital dental medical facility in Bangkok are examined. **Methods.** The present study draws data from a semi-structured interview conducted with dental nursing staff. The population was a total of 15 dental nursing staff, of which the considered sample size used was 8. **Outcomes.** e-Learning and the use of Information and Communication Technologies (ICT) appears to be playing a key role in shaping training provision at the dental facility within the wider context of a hospital. However, the data analysis suggests that e-Learning practices are not widely used, as it is perceived as less effective and more costly than traditional forms of training practices in a group-training room. **Conclusions.** The paper gives some insight into the implications of a variety of raised issues surrounding e-Learning and the application of appropriate strategies that can be implemented. The paper further highlights the nursing staff perceptions in the role ICT plays in e-Learning developments. Data are drawn from a small dental medical facility and thus further hospital-wide research is necessary.

INTRODUCTION

e-Learning can be defined as the instruction that is delivered through the internet or an intranet, or through multimedia platforms such as CD-Roms[1]. e-Learning is often used to teach skills[2], to teach the integration hospital systems, provide another learning avenue and offers a valuable tool for the teaching of medical education[3]. e-Learning continues to be one of the vibrant research topics today [4] and is considered a key factor in driving change by knowledge transfer through technology [5]. Thus e-Learning is creating a new techno-cultural revolution [6] as the fastest-growing technology application in education/training [7]. The research utilises four research questions to ascertain the data related to a closed population of dental nurses. These questions are:

Question 1 - How effective is the present hospital e-Learning strategy?

Question 2 - In what ways do funding arrangements affect ICT developments at this hospital?

Question 3 - In what ways do the eLearning provision affect staff abilities to engage in e-Learning practices at this hospital?

Question 4 - How effective are the ICT support mechanisms at this hospital?

These questions are considered further through the literature underpinning each.

Thailand is experiencing a growth in medical provision and medical developments[8]. Medical staff shortages (Bangkok Post, 23 April, 2012) such as trained dental nurses and the lack of engagement in e-Learning practices has led to difficulties managing dental situations through lack of medical education as well as a lack of unified current training perspectives. However, the rapid growth of the Internet and other developing technologies such as e-Learning 2.0 brings the possibility of a new era for the provision of medical training. Internationally, many researchers perceive that ICT and any consequent e-Learning developments are an enabling technology rather than a foundation for pedagogic developments [9]. Further, the “e” in e-Learning doesn’t necessarily make learning/training easier, simpler, more effective or more cost effective than traditional pedagogical methods [10]. Consequently, the perception of more efficient technologically-based alternatives to traditional medical educational/training provision has clearly focused the

developing e-Learning strategy. As hospitals test out new dimensions of e-Learning relating to training effectiveness[11] creates a new ongoing trend of e-Learning applications [12] that may encompass most hospitals in the near future. The significant barriers to its implementation and consistent use, such as cost and technology limitations, have only recently been addressed and to a larger extent mitigated [13]. This raises the context for the first research question – How effective is the present hospital e-Learning strategy?

Given the above, many health managers in Thailand are being encouraged to recognise that there are some serious issues that need to be addressed such as focusing on e-Learning designs and how these can be integrated into the more traditional training forms using partial-blending practices [14]. Further, using pedagogically modularised programmes so that training programmes can be managed in a more learner-oriented manner would appear to help develop more effective use of expensive resources [4] such as nurses, managers and administration developments and enact changes by applying strategic e-Learning orientations [5] in medical facilities. Accordingly, technology itself could provide a more flexible and much more adaptable approach to e-Learning involvement in training developments. Thus, in the longer-term, managers of medical facilities have new operations efficiency opportunities. These may be directly linked to ICT and any subsequent e-Learning outcomes and become an operational imperative for many hospitals to deliver appropriate e-Learning requirements to interested stakeholders[15]; [16]. This raises the context for the second research question – In what ways do funding arrangements affect ICT developments at this hospital?

The growth in virtual activities (first discussed by researchers in the mid 1980s), allows facilities to expand and increase the flexibility of the training provision. Numerous researchers have discussed digital system developments [17]; [18]; [19] and have shown how user data can be used to provide appropriate content/information streams that match targeted-user training needs. Through this approach, partial-blended learning (based on [14]– a combination of traditional classroom and online study – offers new learning methods and pedagogy, while open source software and courseware facilitate sharing of resources and reduces costly duplication of effort through information technology which has been viewed as a solution to hospital cost and quality problems [20]. Translating this outcome to online technologies are increasingly being utilised to aid in the

training delivery mechanism in medical facilities to address issues of cooperative learning and experiences [21]. This raises the context for the third research question – In what ways do the eLearning provision affect staff abilities to engage in e-Learning practices at this hospital?

These changes promote the more important learner-centred pedagogy that appear to dominate research [22] and indicate that web-based platforms operate more effectively [21]. However, while the use of ICT across such organisations has been implemented, integration into the training arena in health services has been slow to become established[23]. Challenges for hospital management include providing on-going training and research support [24] for increased distributed learning provision. Further, support for off-site nursing provision, staff training and support in ICT developments for administrators [25] and other ancillary staff [26]. There may also be an impact on training, as human resources would be required to be more ICT literate in order to communicate effectively with progressive digital natives using more involved ICT tools and processes. This raises the context for the fourth research question – How effective are the ICT support mechanisms at this hospital?

METHODOLOGY

To develop a much broader and deeper approach surrounding the issues generated within the dental facilities context and to consider more implicitly the issues and questions raised, this empirical groundwork utilised an interpretive approach [27]. This was an attempt to understand the nursing perceptions of dental e-Learning practices. The dental facility was separate and independent unit within the hospital that provided dental facilities to patients in the department and to patients elsewhere in the hospital through mobile facilities. Use of e-Learning was therefore a necessary requirement as the conditions of work required motivated and multiple-skilled personnel experienced to deal with changing work-loads and patient needs.

Hospital dental nursing staff were considered specialist knowledge agents and actors [28], as their opinions and experiences influenced the effectiveness of hospital practices, and the development and application of e-Learning policy. The research used a personal semi-structured interview conducted with dental nursing staff, which provided an appropriate element of context and flexibility [29] and was further aided by applying an inductive/theory building approach [30]. Given the lack of appropriately

focused research in this area, this methodology is seen as suitable for creating contextual data for the purpose of forming richer theory development [31]. The population for this study was made up of all fifteen (15) dental nursing staff (12 female – 3 male) located at a defined dental medical facility among a total of 350 nurses within a private Bangkok Hospital, Thailand – chosen through applying the approach of a targeted population of interest [32] and this reflected the criteria of theoretical purpose, relevance and appropriateness [30]. Further, using appropriate sampling processes [33], a total of eight dental nursing staff (6 female – 2 male) were thus determined as the resultant sample frame, which could also be considered convenience sampling [34].

For ethics approval, hospital management required no more formal engagement than a simple letter asking for permission to carry out the research, as the focus of the research did not involve any part of a clinical trial. Further, each interviewee signed a personal ethics release form and thus informed consent [35] was obtained from all participants in this study. This gave each interviewee's complete confidentiality and this corresponded with the hospital's ethical process requirement to protect staff giving opinions in non-clinical trials research. No data was collected about age, years of training, as these weren't specifically targeted as meaningful factors in such a small research project.

The author conducted the interviews on-site (but outside of the dental facility in the hospital management suite) and used the following protocols. Interviews were not considered part of their job, but were paid as normal. Each interview was audio recorded for future analysis. Interviews were conducted in English and took approximately one hour. All interviews were recorded digitally after gaining explicit permission, and were later transcribed verbatim using the transcribe feature of NVivo 9 software (QSR). The conduct of the interviews follows a process [36], with each individual group being asked the same set of questions – modified through ancillary questioning (probes and follow-ups)[37]. To increase the reliability of the data, the actual transcription was returned to each respondent – via e-mail – for comment, correction, addition or deletion and return, which followed the process of validated referral [38]. Whole-process validity was achieved, as the respondents were considered widely knowledgeable of the context and content, associated with the research [39].

Each interview was coded initially using the Acrobat X

software according to sub-themes that 'surfaced' from the interview dialogue – using a form of open-coding [40]; and [41]. This treatment was also reinforced and extended through the use of thematic analysis conducted using the NVivo 9 – qualitative software package [27]. Each interview was treated and coded independently. Various themes were sensed from the use of the software packages, as well as from the initial manual-coding attempts. This dual form of interrogation was an attempt to increase the validity of the choice of both key themes and sub-themes through a triangulation process. NVivo 9 was further used to explore these sub-themes by helping to pull together each of these sub-themes from all the interviews [42]. In this way, it was possible to capture each respondent's comments across transcripts [43] on each supported sub-theme and place them together for further consideration and analysis.

RESEARCH FRAMEWORK

The outline of the research framework for this study is shown in Figure 1 below.

Figure 1

Figure 1 – Illustration of Research Framework



The framework supported by appropriate literature, illustrated below in Table 1, and further shows the nine sub-themes and subsequent issues raised from the literature forming the basis for this framework.

Figure 2

Table 1 – Framework Literature

Example Research Question and Main Themes	Supporting Literature	Sub-Themes
Hospital e-Learning Strategy How effective is the present Hospital e-Learning strategy?	[44] [45] [46]	Strategic Orientation Utilisation Depth of Coverage
e-Learning Funding/Costs In what ways do funding arrangements affect ICT developments at this hospital?	[47] [48] [49]	Benefits to Users Cost of Units Cost of Development
e-Learning Delivery and Performance In what ways do the e-Learning provision affect nursing staff abilities to engage in e-Learning practices at this hospital?	[50] [45]	Interaction
Hospital ICT Support How effective are the ICT support mechanisms at this hospital?	[51] [52]	Team Issues ICT Skills

The outcomes are stated below where the discussion focuses on the sub-theme elements within each key theme. The discussion format used in this paper reflects the respondent's

voice through a streamlined and articulated approach for reporting. Consequently, the style adopted for reporting and illustrating the data is greatly influenced by [53] and also [54] and is discussed below, focusing on the raised research questions and the resultant main themes.

MAIN RESEARCH OUTCOMES

The various themes developed from the main interviews are presented in Table 1, and are essentially broken down into four key-themes: Hospital e-Learning Strategy; e-Learning Funding/Costs; e-Learning Delivery and Performance; and Hospital ICT Support distributed across nine sub-themes and twenty seven minor-themes. The placement of the sub-themes has been influenced by context of the key theme and relevant sub-themes.

The outcomes are stated below where the discussion focuses on the nine sub-theme elements within each key theme and the subsequent impacts on Hospital Policy and are presented in Table 2, below. The discussion format used in this paper reflects the respondent's voice through a streamlined and articulated approach for reporting. Table 2, below, shows the depth of respondent illustrations/extractions as used in the reporting of this research and the main research outcomes.

Figure 3

Table 2 - Sub-theme observations (other minor-themes are considered of less persuasive significance)

Main Theme	Sub-Theme	Minor-Themes						Total
Hospital e-Learning Strategy	Strategic Orientation	e-Learning Orientation	6	Managerial Importance	11	Managerial Emphasis	4	21
		Utilisation	3	Time	5	Uptake	7	15
	Depth of Coverage	Medical/Administrative Coverage	12	Staff Take-up	9	Hospital Policy	7	28
e-Learning Funding/Costs	Benefits to Users	Software	5	Previous Experiences	4	Importance of Media Use	6	15
		Individual	7	Facility	6	Speed of Uptake	8	21
	Cost of Development	Trial	2	Department	5	Hospital Policy	5	12
e-Learning Delivery and Performance	Interaction	Safety	4	Legal Issues	3	Visibility	3	10
		Collaboration	5	Diversity	4	Connectivity	6	15
	Team Issues	Training Level	3	Necessity	2	Active Learning	4	9
Totals			47		49		50	146

HOSPITAL E-LEARNING STRATEGY

STRATEGIC ORIENTATION

e-Learning was perceived by respondents as necessary, but few knew how to move forward. As one respondent (R3) indicated ...yes, it's something we hope to focus on, but where do you start. Hospitals are complex machines, y'know... Generalised e-Learning courses was perceived by staff to be both fragmented and ill-focused as training courses were seen by many as solely targeted to hospital process skills development (R6). For example, courses

offered appeared to be administrative (patient records) oriented or related to generalised medical training/practices or a reinforcement of emergency procedures. This was seen as opposite to what many nursing staff wanted as one respondent (R5) indicated ...skill-building leading to specific technical courses that would help us with our career aspirations and opportunities. As such, it appears that most e-Learning were focused on technical software packages or procedures and this did little to reduce the administrative burden created within the dental facility. Consequently, as another respondent (R8) suggested ...the hospital has failed us in its e-Learning strategy through the lack of policy development. This was supported by another respondent (R2) who stated that ...this was considered a serious flaw in the Hospital ICT strategy as administration is a support activity, and that this should change to a more centralised-focus for personal learning/training provision.

UTILISATION

It would appear that departments do not have an informed ICT or e-Learning policy (R2) and as another respondent (R1) indicated that ...it is unfocused and unclear. Efforts appear to have been made by the ICT management group of the hospital, which, as another respondent (R6) indicated ...had been given responsibility for assessing e-Learning requirements – but they hadn't talked to us about anything. Another respondent (R4) suggested that ...e-Learning isn't part of what management do. I think they fear the cost and the changes to staff, so that they would have to pay us more.

DEPTH OF COVERAGE

Skills-based programmes appeared to have no strategic involvement, as one respondent (R3) indicated ...they were, kind of, just provided. Respondents claimed that the hospital sought to develop the internal patient-records-payment system, rather than as another respondent (R4) suggested ...possibly to develop fully online e-Learning environments in the near future; but they've been telling us that for a while now and nothing – at least schools get tablets. We get nothing. A number of respondents indicated that the hospital-wide administration system is not effectively integrated into the learning/training sphere as depicted by one respondent (R8) who stated that ...because it could create pressures on the hospital quality system. Another respondent suggests that ...e-Learning isn't used at all. Not in this department anyway. They haven't taught anything new here for a while. This is supported by another respondent (R5) who mused that ...like all new things it just takes time.

FUNDING/COSTS

Nurses had received little external funding for any developments in e-Learning practices utilised. As one respondent (R2) indicated ...no one helps here. No one seems to be interested to help us. No one has the time. I'm sure that if we start it would be different. But the costs are a lot. I can't afford it really.

Management appears to control any e-Learning engagement in the hospital, but not invest in its application very effectively. As one respondent (R6) stated ...some training is carried out through e-Learning, now that we have smart-phones – but not everyone has one of them. So it is difficult, and we have to share. Another respondent (R5) indicated that ...why should we have to subsidise the hospital and purchase a smart-phone just to learn new things. It's not right. We can't afford it. No, not really. Many of the training blocks for dentistry practices appear to be costly and only in the English language only (R5). This presents a variety of problems. As one respondent (R3) stated ...when we have time to do the training, we download the training block and many of the staff have no idea what is being said as they are from the US. This is somewhat supported by another respondent (R8) who indicated that ...all that money spent on training blocks that no one understands – what a waste!

BENEFITS TO USERS

Nurses appeared to understand the immense changes that could occur if they could access and learn when they wanted to. As one respondent (R4) indicated ...if I could actually learn all the material they have available that would be very good, really cool. Another respondent (R1) suggested ...more training and more training, but in the end we're better for it – if only we had the time. On this point another respondent (R8) stated that ...sometimes I wonder about all this training – like with the helicopter emergency procedures – but we never fly in one. An aspect that was raised by respondents was how effective was the training that was carried out. On this one respondent (R7) indicated that ...we don't really know. We haven't had a real emergency to deal with.

COST OF UNITS

Where e-Learning is developed, the funding for any such developments in e-Learning practices appeared to be predominantly targeted to skills-based programmes. As one respondent suggested (R1) ...we get little money here as we're only small. Sometimes others get much more. It's not fair really. Another respondent (R7) stated ...that money is spent on computers - on systems, hardware, software and

other specialised training - in that comes out of the hospital general budget. These are always directed at patients and getting them here, like marketing I suppose. Further, another respondent (R3) suggested that ...the hospital is mad about costs. Our equipment used to be really good, but it costs to repair and maintain. Another respondent (R8) stated that ...they expect us to be trained before we take the job. Never had any training since I got here. No, nothing. Consequently, responses appeared to indicate that insufficient funding was an issue (R5) that possibly affects a nurses procedural and skills development through lack of engagement in an e-Learning platform or related practices.

COST OF DEVELOPMENT

It would appear that a lack of funding for any developments in e-Learning practices was predominantly related to respondents negative association with personal development. On this one respondent (R4) suggested that ...if you can't get the material or you can't understand it, then it's useless. When we get examined, it is often through the same technology. Never-mind, it will get better, I'm sure. Another respondent (R2) claimed that ...we don't really know the financial costs, but we can guess the costs to the hospital and our patients if we don't do training. It would appear that respondents recognised that budgets across the hospital were being maintained at a single level and this had a material effect on the perception of training practices. As supported by one respondent (R7) suggested ...we can buy new material – material that would help us on new development. All we have are what someone else decides. In some ways this is difficult to accept. Another respondent (R1) indicated that ...choice isn't some thing we have here. But, we do our best. Not everyone accepts that though. I wish it was different.

E-LEARNING DELIVERY AND PERFORMANCE

It would appear that most of the on-going training was carried out through e-Learning packages, which provided full on-line access for normal procedural modules, but nurses appeared to have difficulty with access to specialised self-study learning modules. As one respondent (R7) indicated ...for procedural blocks we had it in writing and on the phone or through our computer station. Often though, our access was blocked for specialised material because it would cost the hospital for this access, which is not very good, is it? Practices beyond simple downloading were perceived as difficult. The basis for this appeared to be technological (R5) (both with the hospital system and the hand-sets), as well as behavioural in terms of getting easily

frustrated with a system (R2) that nurses didn't understand. As another respondent (R2) stated ...the hospital system is pretty technical and its difficult to deal with – really difficult. However, the most commonly advised traditional models of skill development based on close delivery of technical skills to nurses appears to be missing, as the system has been designed for other purposes than dental nurse training (R8) – suggesting that dental nurse training is too specialised for the hospital system to manage.

There appeared to be considerable differences between nurses in relation to their approach and knowledge of ICT. For example, some nurses have either ...not considered using e-Learning yet (R1) or had considered it ...but not used it (R7). Various reasons were advanced for this, as one respondent (R5) indicated ...the lack of skills available; but it appears an important and prevalent reason as depicted by another respondent (R8) was ...the perceived complexity of ICT development; and another respondent (R4) stated that ...nurses may not be trained effectively to handle the new e-Learning requirements. However, where e-Learning was practiced in the dental facility, the most commonly used e-Learning activities were the online delivery of specialist software driven course materials; and online management of short-course literature. Nursing staff reasons at the dental facility for using e-Learning were stated as ...cost-reduction (R3); improved ...learning focus and capability (R6); and encouragement of ...nurse-centred learning (R1). However, dental nurses do not appear to have access to ...full online programmes (R4) leading to certification, but can access specialised self-study learning modules (R2). Further, dental nurses appeared to believe that ...these were supplemental to other training courses provided (R7); and were also considered by nurses as lacking in suitably ...critical focused-training aids (R5). These further issues were raised as nurses reported that practices beyond simple e-mail and downloading may be perceived as difficult (R2); except for ...some medical social-networking web-sites (R6) that helped nurses discuss their experiences. However, specialised software companies have contributed to helping the dental facility to deliver remote learning programmes via ...smart-phone (R3) and had ...eased nurses fears of dealing with such practices (R7).

INTERACTION

The research has identified that there is no common e-Learning model in use throughout the Hospital. When using e-Learning, the dominant model the Hospital appeared to be a 'blended' low-level approach (R8). Nurses perceived

reasons ...for the need for them to engage in ICT (R3), although there did not appear to be a consensus as to what to do to get nurses to ...involve us more effectively with e-Learning platform (R4). Consequently, suggestions from respondents included increasing ICT training (R2); ...greater support staff training (R7); ...more funding for ICT infrastructure development (R5); with the consequences of a possible refinement of Hospital ICT strategy (R8).

DEPTH OF COVERAGE

It was identified from the data that only a small number of normal training programmes had some form of ICT involvement – and of this e-Learning provision was characterised as having no involvement beyond e-mail or short-training presentations such as the use of a PDF file to support training topics. Similar conditions were seen elsewhere in the hospital, which currently offers consistent online services for available training courses. There appeared to be instances of partial adoption of a blended approach to e-Learning with some levels of interaction. This, however, was seen ...as tenuous (R4); and was perceived as ...putting too much pressure on some nurses (R3) who appeared to prefer ...a more traditional approach for their training (R8) such as gaining experience through actual classroom time.

HOSPITAL ICT SUPPORT

When considering ICT staff skills (their ability to provide universal access and produce electronic resources) the extent of the take-up of e-Learning does not appear to have been ...well deployed (R1) or seemingly ...well utilised (R4). Utilising a soft blended-learning activity (e-Learning and mostly traditional approaches such as PDF docs) appeared to have become ...more widespread (R4), and was seen by many staff as a ...support mechanism (R3) outside scheduled training sessions. This may be due to a redefinition or retrenchment of ...training practices/activities (R7), as soft blended-learning could be more readily backwards-converted into more traditional training events. Nursing staff perceived that support staff with specialised skill development in ICT practices was inadequate (R5); ...not focused on their particular training needs (R2); and did not provide adequate ICT coverage (R8) for their training requirements. However, new ICT initiatives and training for specialised support staff (technical) were ...continuously being developed and applied (R4). However, nursing staff did not appear to be ...actively trained in the use and application of e-Learning practices (R1).

TEAM ISSUES

It would appear that dental nursing staff ...were not encouraged to try (R6) or ...utilise (R3) e-Learning practices outside the hospital. The gap between nurses' skills in their personal use of ICT at the hospital and their skills in using ICT at home does not appear to have been bridged with training or increased ICT interest. This may reflect a lack of hospital confidence in their partial use of ICT in public (R2) or the lack of availability of ICT support services (R8). Training practices, which involved group engagement, did not appear to be successful when part of the training was co-ordinated through an incongruent e-Learning exercise. As one respondent (R4) suggested ...it was confusing and I lost interest very quickly. Another respondent (R7) indicated that ...it's difficult to know what others think if they don't have a smart-phone or can't contact us.

ICT SKILLS

New ICT initiatives for specialized staff (technical) were continuously being developed and applied, as one respondent (R2) indicated ...we get all sorts of training here. Another respondent (R6) suggested that ...much of our training is for us, not for other staff, so we have a limited training schedule to help other staff. As such, dental staff would appear not to be actively trained (R5) in the use and application of eLearning practices.

DISCUSSION - IMPLICATIONS

The above research outcomes generally suggest that e-Learning practices are in a state of flux and reflect early introduction issues. e-Learning appears therefore an emerging field [55] and presently considered by many at the dental facility as innovative [56]. Although technically feasible [57], e-Learning offers possibilities at the dental facility that are seemingly pedagogically sound [2], and which could create probable opportunities for a sustained and wide-scale deployment [12] in the Thai health industry. That is, some nursing staff appear to want to use e-Learning, whilst others are not so convinced. However, there does appear to be a dichotomy between dental nursing staff and the hospital management strategy, which must be bridged if a more effective e-Learning strategy is to be developed and utilised. Further implications are discussed below using the four questions and the main themes from the research framework contained in Figure 1, above.

Hospital e-Learning Strategy - How effective is the present hospital e-Learning strategy?

The main outcomes of this research strongly indicate the implications for a broader strategic hospital e-Learning environment. This is controlled by hospital management who determine whether or not e-Learning developments will be successful and/or ultimately improve sufficiently to meet learner/trainer needs [58]. In this respect, this shapes the hospital strategy targeted to efficiency gains, rather than pedagogic/training requirements [59]. Further, this study also confirms Fullan's [60] exposition on the importance of connecting ICT policy development with capability and capacity building as underpinned by the complexity of interaction between the hospital infrastructure and ongoing and developing e-Learning practices [61]. The hospital does not appear to provide a specific e-Learning strategy for the dental facility or a published policy for e-Learning practices - although it appeared to be wholly recognised that an ICT strategy in hospitals was now fundamental to good operating requirements [49].

It would also appear that the ICT strategy is narrowly focused on administration issues by providing support staff with an integrated hospital-wide system that allows nursing staff access, for example, to their patient's personal data, examination results and health related data - which may not provide for the most appropriate focus for a hospital-wide e-Learning strategy engagement [62].

e-Learning Funding/Costs - What funding arrangements are you aware of that affect ICT developments at this hospital?

The focus on ICT support is on hospital administrative tasks - which have been viewed as a solution to a hospitals' patient process cost and quality management issues [20]. This may need to be reviewed as this does little to offer dental nursing staff confidence in helping to engage in building an appropriate e-Learning platform. This was based on the overwhelming view that e-Learning developments was seen as a managerial cost/efficiency exercise [63]. The large increase in patients and increased competition recently [64] has put a strain on the level of access available to patients; on the Hospital infrastructure as a whole; and on the dental facility training demands. It would seem that the Hospital management has a major influence on the direction of ICT and e-Learning development. So has the cost of technology which appears to have a negative affect on its functional and pedagogic/training use [65]. The application of future low-level technological and pedagogic options [66] may thus inhibit rational ICT development and seriously affect continuing dental nursing staff engagement in e-Learning practices - at least in the short-term.

e-Learning Programme Delivery and Performance - In what ways do the eLearning provision affect staff abilities to engage in eLearning practices at this hospital?

When using eLearning, the dominant model the hospital uses is a partially 'blended' approach, combining ICT and traditional methods to deliver classroom learning/training [14]. There is also the potential to establish a collaborative teaching and learning community [67], which - from the data - appears ineffective in the present situation. This is possibly not a result of strategic import, but as a consequence of managerial disengagement and the perceived low level of enthusiasm or interest of dental nursing staff relating to ICT developments. However, close delivery of technical skills may not be the most effective approach for the development of important e-Learning outcomes [68]. Further, the perception of an inadequate e-Learning engagement from nursing staff may have the affect of low-levels of participation [4]. These findings also corroborate the outcomes of [69] suggesting that in the short-term there is little constructive development in e-Learning policy at this hospital which may give rise to important operational and financial concerns in the longer-term. Thus, the notion is that ICT has become a critical component in the health/education/training system [70] in order to enhance, improve and eventually to transform the hospital through meeting staff learning/training concerns.

Hospital ICT Support - How effective are the ICT support mechanisms at this hospital?

The lack of effective engagement by support services in this study signifies a particularly important issue [71]. This does little to address the very necessary requirements of support in the development of hospital-wide e-Learning practices, which would present the need for a significant change in training, and administrative practices [72].

It would appear that the hospital is applying possible partial future technological and pedagogic options [65]; and that this is viewed as unsympathetic by many dental nursing staff to their training needs as it is perceived as an efficiency measure [63] as the support mechanisms remained unclear.

Dental nursing staff did not appear to be actively trained in the use and application of e-Learning practices leading to speculation regarding the efficacy of the role and responsibility of management [73]. Further, dental nursing staff does not appear to be helped to engage effectively with support practices integrated into a wider system of ICT

management [70]. Consequently, there appears to be little managerial support for widespread staff e-Learning engagement or technology-enhanced learning[74].

LIMITATIONS

There would appear to be several limitations of this investigation that require acknowledgment. The outcomes are regarded as a substantive model fully representing the context of the study setting[75] and the views of key informants. However, this model may be applied to other similar settings, but more research is needed to explore these types of contexts. Some respondents may have felt reluctant to complain or provide negative feedback about their engagement with e-Learning - especially when interviewed at the hospital. This was considered an acceptable risk factor in terms of the validity of the research outcome as this is mitigated through the notion that respondents had time to consider their experiences and expectations of e-Learning developments and knowledge. Further, research also needs to be carried out with other actors that are involved in managing the process of providing and developing e-Learning at the hospital.

CONCLUSION

The findings of this small-scale study corroborate the outcomes of Collis and van der Wende[76] in that knowledge management and training in relation to the use of ICT has been gradual, sporadic and unsystematic. In practice, this reflects a combination of specific and unrelated environmental parameters such as strategic intent and financial feasibility. The data would indicate that in order to move the hospital to a more informed framework for utilising e-Learning practices, more involvement is required by management and dental nursing staff. Support services linking e-Learning developments to the wider hospital community through more effective measures designed to enhance and improve present practices and attitudes may result in greater confidence in its use. Thus, e-Learning - reflecting a useful managerial tool - could be placed and/or adapted to create a more effective hospital training system.

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