

Nurses' Informal Learning using Mobile Devices

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ABSTRACT

This paper provides an overview of a mixed methods study focusing on how registered nurses (RNs) use mobile devices for informal learning in the healthcare workplace. The significance of mobile devices as learning tools for RNs' informal learning to inform professional development and continuing competence is discussed.

Author Keywords

Informal learning, mobile devices, nurses, mixed methods, sequential explanatory

INTRODUCTION

In the Canadian healthcare workplace, in-person workplace-based education and training of nurses is becoming less readily accessible. This has created the need for RNs to seek other means for continuous learning for professional development and ongoing maintenance of competence (Canadian Nurses Association & Canadian Association of Schools of Nursing, 2004, p. 2). In the healthcare workplace, RNs are using mobile devices for a variety of purposes, including as learning tools (Doran, et al., 2010); however, how they use these learning tools is not well known. In response to these challenges and to address the paucity of research in this area, this mixed methods study explored how RNs use mobile devices for informal learning in the healthcare workplace. In doing so, this study adds to the theory base of informal learning and to the body of knowledge on workplace learning.

BACKGROUND

In the workplace, most learning is informal in nature (Cross, 2007). Although the preparation for a job or career typically involves formal education or training, once employment is obtained, informal learning is the primary way in which skills and knowledge are sought. It includes "any activity involving the pursuit of understanding, knowledge or skill which occurs outside the curricula of educational institutions, or the courses or workshops offered by educational or social agencies" (Livingstone, 2000, p. 2).

As a regulated profession, RNs in Canada are required to maintain competency through mandated continuing education and reflective practice for professional development (Nelson & Purkis, 2004). Moreover, the RN regulatory bodies have moved away from clocking hours for continuing professional education participation towards continuing competency programs where RNs have the autonomy and flexibility to identify individual learning needs and select appropriate continuing professional education activities to meet those needs. Attendance at workplace face-to-face education and training programs has become limited due to the barriers of "workplace budget constraints, lack of employer or administrative support, and lack of time due to staff shortages, shift work, scheduling difficulties, and family responsibilities" (Penz et al., 2007, p. 58). Consequently, informal learning provides an appealing alternative for these challenges and offers optimal flexibility for meeting the learning needs of RNs for ongoing professional development and competency.

Within the healthcare workplace, mobile devices have become more commonplace, expanding the boundaries of just-in-time learning and enabling users to interact with others, connect to information of their own choosing, and capture ideas (Traxler, 2010). With the ongoing healthcare workplace challenges, it may be necessary to move from traditional models of teaching and learning and consider other pedagogical practices and learning models, including informal learning using mobile devices to assist RNs to meet their ongoing needs for professional development and continuing competence.

RESEARCH PURPOSE AND QUESTIONS

Within the context of the healthcare workplace, this mixed methods study was conducted to initiate and/or add to the body of research by exploring how RNs engage in informal learning using mobile devices in the healthcare workplace. The study's research questions that were drawn from the theory on informal learning are listed below.

1. What informal learning strategies or processes do RNs engage in when using mobile devices in the healthcare workplace?
2. For what purposes do RNs employ informal learning strategies or processes using mobile devices in the healthcare workplace?
3. Are there differences between how RNs use individual and collaborative modes of informal learning with mobile devices in the healthcare workplace?

4. Is there a relationship between the age of RNs and their use of mobile devices for informal learning in the healthcare workplace?

THEORETICAL FRAMEWORK

This study's theoretical framework is multi-faceted, drawing from theories of workplace learning and informal learning within the field of adult education, and also involving mobile devices and their use as learning tools. The workplace is an important context for the intertwining processes of learning and work (Streumer & Kho, 2006). Learning where people actually work includes the training and development perspectives of human resource development and continuing professional education (Bierema & Eraut, 2004).

Informal learning includes learning that is self-directed and intentional, incidental or unplanned learning that becomes conscious after an experience, and tacit learning that is neither intentional nor conscious (Schugurensky, 2000). Watkins and Marsick's (1992) theory of informal and incidental learning in the workplace identifies the following characteristics:

based on learning from experience; embedded in the organizational context; oriented to a focus on action; governed by non-routine conditions; concerned with tacit dimensions that must be made explicit; delimited by the nature of the task, the way in which problems are framed, and the work capacity of the individual undertaking the task; and enhanced by proactivity, critical reflectivity and creativity (p. 287).

More recent models of informal and incidental learning in the workplace include the concepts of tacit/implicit knowledge, whole-person learning theory, and communities of practice (Marsick, Watkins, Callahan, & Volpe 2006).

The creation of knowledge and meaning that occurs through the informal learning using mobile devices can be viewed from the perspective of cognitive and socio-cultural constructivism. Cognitive constructivism contends that learners construct new knowledge individually based on previous learning; whereas, socio-cultural constructivism asserts that knowledge is constructed collaboratively through social discourse (Crawford, 1999). Depending upon the context, either theory may help to explain the processes involved in the use of mobile devices as a tool for informal learning. Clough, Jones, McAndrew, and Scanlon (2009) explain that mobile devices as a learning tool can potentially support and enhance learner-centred control, allowing learners "to engage with both the social and the physical contexts of the learning they are undertaking ... and to decide whether and how to collaborate with other learners, to pool and share resources, or simply engage in individual reflection" (p. 361).

METHODOLOGY

The mixed methods, sequential explanatory research design included two phases with a quantitative online survey and qualitative interviews. The cross-sectional survey identified demographic information, informal strategies, processes, purposes, and individual/collaborative modes of informal learning of RNs who used mobile devices in the healthcare workplace. The qualitative data obtained from the semi-structured telephone interviews provided further explanations of the quantitative results. Both of these data collection methods operationalized the research questions.

The population was composed of approximately 1450 diploma-prepared and practicing Canadian RNs in a Bachelor of Nursing program at a single-mode distance university in Western Canada. For the cross-sectional online survey, subjects were recruited using email. Quota sampling obtained a minimum of 15 participants reporting collaborative modes of informal learning and a minimum of 15 participants in each of the age-generational categories of Generation Y, Generation X, and Baby Boomers. 170 useable online surveys were obtained and quotas were reached.

A survey questionnaire was developed containing three sections: respondents' background information, mobile device usage, and learning modes. The strategies/processes for the informal learning mode included: (1) reflect on previous action and knowledge using notes, diary, or some other method using my mobile device; (2) learn by trial and error; (3) view a video, webcast or podcast; (4) search the Web (including the Intranet); (5) search an online database (e.g., Medline); (6) read books, magazines, and/or journals; (7) observe others on the job such as photos; (8) talking on the phone with others; (9) interacting with others via emails; (10) asking questions in a professional listserv or online community. The first seven strategies/processes were considered individual modes of informal learning while the last three processes were considered potentially collaborative modes. The purposes for informal learning using mobile devices included: (1) new procedure/treatment; (2) accessing resources for evidence-based support; (3) professional development; (4) patient/client teaching; (5) maintaining competence. The questionnaire was field tested for content validity.

From the online survey responses, interviewees were selected using maximum variation purposive sampling based on diversities in gender, generational-age, location, work setting, position, years employed as a RN, type of mobile device used, length of mobile device usage, and frequency of use for individual and collaborative modes. Purposive sampling continued until data saturation was achieved. Ten subjects were interviewed. The semi-structured interview questions were piloted prior to administration. The interviews were digitally recorded, transcribed, and member checked. As a token of appreciation, respondents completing the online survey had the option of participating in a draw for an iPad® and interviewees had the option to receive a \$40 gift certificate. Ethical considerations were also addressed.

Analysis of the study data included descriptive and inferential statistical analysis of the non-parametric online survey data, inductive analysis of the semi-structured interview data, and integrated analysis of both datasets.

RESULTS AND DISCUSSION

The descriptive profile of the study RNs indicated the majority were female Baby Boomers employed for over ten years as staff nurses in urban Canadian hospitals. These RNs primarily used Smartphones in their workplaces, for less than two years. Using Rogers' (2003) adoption categories, nearly 98% of the subjects could be considered as innovators or early adopters in terms of their mobile device use for informal learning in the healthcare workplace; a possible study limitation as the subjects may be more receptive to new technologies including mobile devices than the general nursing population.

Based on a four-point Likert rating scale from never (1), sometimes (2), often (3), and always (4), Wilcoxon Signed-Ranks revealed statistically significant differences at the 5% level ($Z = -11.312, N = 170, p = .000$) indicating more subjects used the strategies/processes for informal learning without a mobile device in the healthcare workplace ($M = 31.37, SD = 5.15$) than those using a mobile device ($M = 22.21, SD = 6.49$). Such a finding is not surprising, considering as Doran et al., (2010) suggest, the use of mobile devices in nursing practice is relatively new in the healthcare workplace.

The interviewees and survey respondents indicated frequent use of their mobile devices for *searching the Web* ($M = 2.88, SD = .867$) and *searching an online database* ($M = 2.56, SD = .956$). In the survey responses and narratives, the least used process was *asking questions in a professional listserv or online community* ($M = 1.87, SD = 1.022$). Berg and Chyung's (2008) study obtained similar results with professionals using this process the least frequently for informal learning. The subjects reported participating in self-directed informal learning using their mobile devices that was planned, intentional, and conscious in response to new and changing situations in the healthcare workplaces. This experiential learning was evaluated through reflective practice. In the survey, the incidental process of *trial and error* was the second lowest frequency reported ($M = 1.90, SD = .896$). Only one interviewee reported using *trial and error* for informal learning with a mobile device. No indications of tacit learning were found in either the quantitative or qualitative analysis.

The purposes for informal learning using mobile devices cited most frequently were *accessing resources for evidence-based support* to promote the delivery of patient/client care and for *professional development* for knowledge and skills acquisition to inform their professional practice. A Chi-square test revealed that *accessing resources for evidence-based support* ($X^2(1, N = 170) = 10.376, p = 0.001$), and *professional development* ($X^2(1, N = 170) = 7.624, p = 0.006$) were statistically significant at the 5% level. As in Berg and Chyung's (2008) study, participants may be more likely to engage in informal learning strategies/processes for gaining new knowledge that was necessary to perform at a higher level in their professional practice. Quantitatively and qualitatively, the least reported purpose of informal learning using a mobile device was for *maintaining competency* ($X^2(1, N = 170) = 7.624, p = 0.006$). The interviews suggested a general unawareness of the potential contribution of informal learning using mobile devices for professional practice competency and registration requirements. This deficit may have influenced the responses for the purpose of *maintaining competency*.

Quantitatively, collaborative modes ($M = 2.33, SD = .885$) were used, on average, slightly more than individual modes ($M = 2.21, SD = .696$). The interviewees reported using all of the individual modes for informal learning with mobile devices. Only two narrative accounts included the use of collaborative modes, *interacting with others via emails* and *asking questions in a professional listserv or online community*. However, five interviewees stated that they emailed via their mobile devices for communication purposes only with clients and peers. Relevant to these findings is the Clough et al., (2009) study on PDA and Smartphone use with informal learning that stated some participants used their devices to communicate, but lacked awareness as to their participation in collaborative informal learning. The divergence in findings suggests the need for further research. For the purposes, the Mann-Whitney U-test revealed that only professional development was not significantly different at the 5% level ($U = 2365.5, p = 0.056$). Interviewees reported using primarily the individual modes for the purposes of informal learning using their mobile devices to construct new knowledge based on previous learning, as described in the perspectives of cognitive constructivism. Wihak and Hall (2011) assert that individual modes are the preferred form of self-directed informal learning.

Minimal differences were found related to age-generational categories for informal learning using mobile devices in the healthcare workplaces. No differences were noted in the narrative accounts. Kruskal-Wallis tests revealed a statistically significant difference at the 5% level for only the process of *interacting with other people via email* ($X^2 = 6.947, p = 0.021$) and the purpose of *professional development* ($X^2 = 6.078, p = .047$) suggesting Generation Y uses this process and purpose less than the other age-generational categories. No significant differences were found among the age categories related to the individual or collaborative modes of informal learning. Livingstone's (2000) Canada-wide survey found Canadians under the age of 24 years spent significantly more time in informal learning activities than older adults but no differences were found for the other age categories. As there were no RNs in this study under 24 years of age, the findings on frequency of use of mobile devices for informal learning related to age were similar to Livingstone's results.

The narrative accounts indicated the lack of educational resources in the healthcare workplaces influenced the use of mobile devices for informal learning. All but two of the interviewees used their own mobile devices and data service plans to engage in informal learning in their workplaces. The lack of Internet connectivity and/or lack of employer support may have influenced the interviewees' selection of informal learning strategies/processes. Positive perceptions of efficiencies, self-confidence, patient/client safety, and reactions by patients/clients were cited by the interviewees. Also, the need for the sanctioned resources for using mobile technologies in the healthcare workplace was articulated.

CONCLUSIONS

In this mixed methods study, RNs expressed the importance of informal learning using mobile devices in the healthcare workplace for acquiring knowledge and skill development. Furthermore, as the use of mobile devices becomes more ubiquitous, there is the potential for this powerful tool to rapidly accelerate participation in informal learning in nursing practice. Recommendations for practice and future research include: (1) RNs acquire more information and/or education from their nursing associations on self-directed informal learning including how to apply this learning for continuing competency requirements for self-regulation and professional practice, (2) further exploration of the expressed need for sanctioned resources (3) investigations into the workplace influences (4) research into the motivations for engaging in this learning, (5) further study of individual and collaborative modes. Additionally, investigations with other professionals and longitudinal studies are needed on informal learning with mobile devices in the workplace.

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