A Case Study Examining the Impacts of Conferencing Technologies in Distributed Healthcare Groups

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Abstract

As healthcare groups continue to communicate and collaborate at a distance, information and communication technology (ICT) has come to play an increasingly important role in supporting such interactions. In this paper, we describe key lessons learned from a two-year case study (2004–2006) on the impacts of conferencing technologies on social interaction norms within knowledge exchange groups.

Introduction

Within the healthcare field, a growing interest has risen in how the use of information and communication technologies (ICT) encourages decision-makers and researchers in forming collaborative research partnerships. Such partnerships are engaged in collaborative problem-solving through information exchange, synthesis, or the application of research. This is referred to as "knowledge exchange." In the past, Canadian researchers and decision-makers have primarily engaged in face-to-face knowledge exchange activities. The literature on knowledge exchange has not, to date, fully examined the potential role of ICT in supporting groups working at a distance from one another.

This paper focuses on the impacts of conferencing technologies on social interaction norms in distributed environments. The basic research question is the following: do conferencing technologies have an impact on knowledge exchange social interaction norms in distributed groups? Three cases that focus on this problem are examined in this paper.

Information and communication technologies, in general, are playing a larger role in healthcare organizations.

Rationale

There is growing evidence that information and communication technologies, in general, are playing a larger role in healthcare organizations. The role of information and communication technologies (ICT) has primarily focused on administrative and financial systems, clinical systems to support the care process, and information technology infrastructure to support both the administrative and clinical systems (MedPac 2004). Few studies in health informatics, such as Patel et al. (1999) and Shortliffe et al. (1998), have examined the use of conferencing technologies to support researcher and decision-maker collaborations, which is a cornerstone of the knowledge exchange process. Outside of health informatics, researchers in ICT have focused on social interaction norms that impact areas such as group use and adaptation of ICTs to facilitate work (Jorgen and Erling 2006), on distributed simulation problem-solving (Scanlon et al. 2005), or on studying group behaviour in distributed groups (Bazarova and Walther 2009). Research on the impacts of ICTs on decision-maker and researcher social interactions is limited.

The Canadian Health Services Foundation (CHSRF) defines knowledge exchange as the collaborative problem-solving between researchers and decision-makers that happens through linkage and exchange (CHSRF 2008). Linkage and exchange describes a process in which researchers and decision-makers engage in ongoing interaction, collaboration and exchange of ideas (CHSRF 2008). Linkage and exchange also involves researchers and decision-makers working prior to, during, and after the research program (CHSRF 2008).

Understanding how social interactions impact knowledge exchange in a distributed environment represents an opportunity to enhance how such activities are carried out.

This research has obvious implications for practice. Understanding how social interactions impact knowledge exchange in a distributed environment represents an opportunity to enhance how such activities are carried out.

Methods

A case study approach was selected as an appropriate method for this research. Case study research appears in the social sciences, health informatics, knowledge exchange, and the ICT literatures. A widely accepted research methodology, it serves to describe the real-life context in which an intervention has occurred, and demonstrates the details of participant viewpoints through the use of multiple data sources (Yin 2003).

For this case study, three drug policy groups were observed over a two-year period between 2004 and 2006. There was an education task group, research task group, and decision-making task group. The education task group consisted of academic detailers who worked collaboratively to produce research reviews regarding new drugs to disseminate to physicians. Of the 26 potential participants in the education task group, 20 were included in the study. The six that were excluded were observers and administrative assistants. The 20 participants included in the education task group were researchers, educators, and decision-makers.

The research task group was charged with the task of evaluating the cost savings of physician educational interventions. It included collaborations between researchers and decision-makers working on the evaluation of education for quality improvement in patient care. Of the 17 potential participants in the group, 14 researchers or decision-makers were included in the study. The three that were excluded were observers and administrative assistants.

For the drug policy task group, decision-makers and their staff met on a monthly basis, using live teleconferencing as a communication method. A designated researcher would disseminate research information on the latest drug policy research trends. Of the 32 potential participants in the decision-making task group, 27 were included. The five excluded were observers and administrative assistants. The 27 participants included in the decision-making task group were researchers, decision-makers, and staff from provincial Canadian drug plans.

Technologies Used

The web-conferencing technology used in the study was Elluminate Live V-Class edition. The version of the technology employed in the study allowed for half-duplex audio communication that permitted users to speak one at a time. Elluminate allowed users to upload the agenda to the whiteboard, share documents via application sharing, use instant text messaging, vote/poll participants, use emoticons, raise hands, and see participants' names. These were the most relevant features used by the groups in the study.

The education and research task groups used Elluminate Live V-Class edition to participate in the meetings. To participate, group members needed a computer, microphone, speaker or headphones, and an Internet connection.

For teleconferencing, the education and decision-making task groups used audio teleconferencing technology. The technology used audio only communication where multiple participants could speak at a time; there was no video or other media for communication. A participant simply dialled a telephone number, entered a conference code, and responded to a prompt requesting his or her name. A beep sound let other participants know that someone had joined the meeting. To use this technology, group members needed access to e-mail and a telephone. E-mail was necessary to inform the participants about the meeting details (time, numbers to dial, and the agenda). A telephone was required to participate in the meeting.

During face-to-face meetings, group members met in a designated room where the chairs were arranged around a space or a table. An image projector connected to a computer sat in the middle of the meeting setup. The image projector projected items onto a screen; the agenda and other related meeting documents were projected throughout the meeting. In addition, paper copies of the material presented on the screen were made available to group members. Within the meeting room, there was also a chalk board and a flip chart; however, these items were not used by the groups included in the study.

Data Collection and Analysis

Different data were collected for the three drug policy groups between 2004 and 2006. The data were collected in three phases. Phase 1 data included a compilation of baseline inter-

view and observation data for the education task group and the original research task group. No baseline data were collected for the decision-making task group because they were not available. Phase 2 data included recorded meeting transcript data for the three drug policy groups. Phase 3 data included post-interview data and survey data results for the three drug policy groups.

With regard to transcription of meetings and interviews, the researcher transcribed all baseline interview data and hired a transcription company to transcribe the meetings and the post-interview data. The baseline interview, meeting, and post-interview data were transcribed verbatim.

Content analysis was utilized to analyze the data. In general, content analysis is a data analysis approach that can be used to analyze qualitative data; it is a systematic process of analyzing communication messages and making inferences based on the analysis (Berg 1989; Kondracki et al. 2002). Content analysis involves the interpretation of textual data that has been categorized into concepts. Once the identification of concepts or categories has taken place, they are categorized into themes based on their relationships with each other (Lau and Hayward 2000).

Lessons Learned

Social Presence theory attempts to understand "those communication behaviours that enhance the closeness to, and non-verbal interaction with, each other" (Mehrabian, cited in Rourke et al. 2001). The concept of social presence suggests that a higher degree of interaction between individuals materializes with a greater presence of non-verbal cues, body movement, and eye contact, which increase sensory stimulation (Mehrabian, cited in Rourke et al. 2001). Such high-level interactions are found primarily in face-to-face interactions. According to the participants' views, both the education and research task groups preferred meeting face-to-face because of the groups' preference for a higher degree of interaction. However, due to budget and geographical constraints, the education task group communicated via teleconferencing and web-conferencing, whereas the research task group, not affected by the same constraints, was able to meet face-to-face. As for the decision-making task group, teleconferencing was the communication method of choice. Because most of the individuals were only on the teleconference to hear about the latest research studies from a credible researcher in the field, there was no need for collaboration between individuals of the group.

These results are similar to those Orlikowski and Yates (1994) found in their study of technology-enabled computer language designers who collaborated on a multi-year project involving development of various programming languages. The authors found that different group inputs affected how the group chose to communicate with each other. Over time, the group reinforced the pattern of how they communicated with each other until the technology they chose became the main method with which group members worked with each other. Jorgen and Erling (2006) refer to this type of adaptation as sense-making, where "the point is that people try to make things rationally accountable to themselves and attempt to produce some kind of stability and order amidst continuing change." For example, within the education task group, group social interactions changed over time. The group initially started using web-conferencing to display PowerPoint presentations and continued with their discussions using teleconferencing technologies. Over time, as the group became more familiar with web-conferencing technology, they abandoned the teleconferencing system and started to rely exclusively on the web-conferencing communication system.

Furthermore, within this study, collaborative working groups, such as the education and research task groups, preferred face-to-face social interactions whenever possible. However, because the education task group was geographically dispersed and did not have the budget to meet face-to-face, conferencing technologies such as web-conferencing became the alternative method of communication. As the group started to use web-conferencing, they started to adapt and modify their social interactions around the technology. For example, the education task group would always perform a communication check at the beginning of a web-conferencing meeting to ensure that group members were heard clearly and were able to speak via the web-conferencing tool. For the researcher task group, because they were co-located and had the budget to support face-to-face communication, they abandoned the use of conferencing technologies for face-to-face social interactions. For the decision-making task group, because it was a non-collaborative type group, the use of teleconferencing to support social interactions was sufficient for the purposes of the group.

Conferencing technologies can impact social interactions within knowledge exchange groups.

Study Limitations

Case study methods have been criticized for not being able to generalize their results to other times, places, or settings. For case studies, generalizations or transferability of findings are limited to a case or to cases with similar attributes (Tellis 1997). However, by analyzing a rich set of descriptions of the research setting and context, as were offered within this study, the reader of the case study will be able to determine the similarities in the research context and determine the applicability of the research findings to his or her own setting.

The use of technology was demonstrated to lead to changes in social interaction norms and leading to the migration from the use of one technology to another.

Conclusion

This research showed that conferencing technologies can impact social interactions within knowledge exchange groups. For example, when the group is geographically dispersed and there is a limited budget to support travel, the group is more likely to rely on conferencing technologies to support group social interactions. As the group starts to use these technologies, they begin to adapt to them and use them in a way that makes sense to the group. The use of technology, over time, was demonstrated to lead to changes in social interaction norms, such as introducing communication checks at the beginning of meetings, and leading to the migration from the use of one technology (teleconferencing) to another (web-conferencing). When the group (i.e., the researcher task group) was collaborative, co-located, and had a budget to support travel, face-to-face interactions were the preferred method. Furthermore, when the group was non-collaborative and geographically dispersed, such as the decision-making task group, the use of teleconferencing to support social interactions was sufficient for the group. EH

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