A window into lecturers' conversations: With whom are they speaking about technology and why does it matter?

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With the rapid rise in interest in open and online education and flexible learning initiatives across the higher education sector, senior administrators are establishing strategies and policies concerning technology-enabled learning. However, technology adoption and integration with pedagogical practice is complex and multi-dimensional with the socio-cultural nuances that impact acceptance often remaining undetected. Reporting on a subset of results from a larger investigation of factors influencing lecturers' technology adoption, in this paper the author reveals how the relational ties and technology-related conversations amongst lecturers stimulate the exchange of ideas. Understanding how lecturers learn about new technologies can help higher education leaders to provide the support mechanisms necessary to foster further knowledge sharing and eventual technology adoption by educators.

Keywords: flexible learning, social networks, higher education, technology adoption

Introduction

Learning management systems (LMS), such as Blackboard, Moodle, and Desire2Learn, are now considered to be a staple technology in the higher education sector. The LMS has essentially transitioned from being an optional innovative technology for extending learning activities outside of the brick and mortar classroom (Hagel, Brown, & Davidson, 2010) to a globally-recognized and required learning application. An LMS today offers a suite of online tools for course organization, communication, and assessment (Siekmann, 1998) that can be used to support the implemented learning activities. With such a range of tools, the LMS "facilitates instructors' management of the course and gives students access to all of their course components in one location" (Kabata, Wiebe, & Chao, 2005, p. 239). While many lecturers use the LMS for disseminating information to their students (Arnold, 2007), others take advantage of its collaborative communication tools for engaging students in discussion outside of the traditional classroom (Cho & Carey, 2001; Levy, 2010). The rise of massive open online courses (MOOCs) in the global education market has placed pressure on the more traditional and predominately face-to-face institutions to revisit the overall concept of flexible learning (Conole, 2010). Furthermore, the uptake of MOOCs by some elite institutions has effectively shifted academic and public perception of online education from the sidelines of teaching and learning activity to the mainstream. Hence, higher education leaders have begun to establish core policies and strategic plans integrating flexible and fully online learning. This largely involves institution-wide adoption of the LMS, as a first step for establishing a learning environment that reflects and facilitates flexible access to education. Now that the LMS is more commonplace in higher education, we are seeing the emergence of new technologies in the educational community. This innovation and adoption cycle is similar to that of the LMS in the late 1990s. Understanding the factors that influenced lecturers to use the LMS when it was an optional and innovative technology may help higher education administrators to determine the support structures that can speed up acceptance of new technologies within their institutions (Abrahams, 2010). One such factor for influencing acceptance and adoption derives from the networks formed and conversations held among the teaching staff.

Technology adoption and conversations

According to Rogers' (1995) Diffusion of Innovation model, technology adoption generally follows a bell curve with a small number of individuals, the innovators, beginning to use a technology when it is first introduced followed by a gradual increase in the rate of adoption, with a decline after the majority of individuals in a given community have begun to use it. The lead innovators or early adopters, therefore commonly demonstrate the potential of a new technology and its context in learning and teaching practice for their colleagues (Bates, 2000; Rogers, 1995). Figure 1 shows the Diffusion of Innovation model and the typical rate of adoption in a given community.

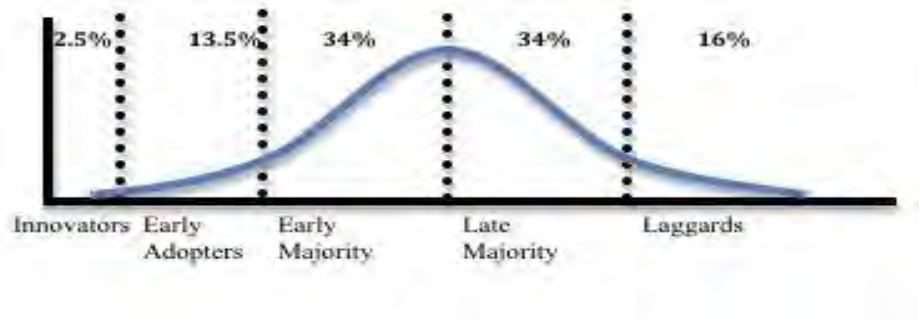

Figure 1. Diffusion of Innovations Model. Adapted from Rogers (1962).

In the higher education context, lecturers who are regarded as the innovators or early adopters can influence technology acceptance by mentoring their colleagues (Roberts, 2008). Furthermore, the conversations amongst lecturers in their professional social networks have been shown to influence teaching practice (Roxa & Martensson, 2009). As Mirriahi, Dawson, and Hoven (2012) posit, lecturers who are more technically advanced, frequently occupy positions of influence in the social networks of their academic departments. These facilitating or *brokering* positions effectively control the informal flow of technology-related information (or conversations) amongst peers in their network. Goffman (1959) refers to the informal conversations amongst individuals that occur privately as *backstage* behaviour that is unrestrictive and allows colleagues to express themselves openly and freely. Connections between colleagues are often based on trust and honesty leading to openness in conversation (Niesz, 2007; Roxå, Mårtensson, & Alveteg, 2011). Therefore, trust and the ability to communicate freely are necessary for lecturers to share their technology-enhanced learning experiences and ideas with others without fear of judgment or disapproval.

Previous studies have suggested that conversations with colleagues who are more technically advanced, or through the establishment of formal mentorship opportunities, can influence an individual lecturers' technology adoption decisions (Mwaura, 2003; Kopcha, 2008; Oncu, Delialioglu, & Brown, 2008). For instance, Mwaura's (2003) technology adoption study revealed that lecturers who adopted educational technology received mentorship and collaborated with colleagues. However, to date there are few studies that explicitly explore the various types of conversations lecturers have concerning technology and its application in the learning and teaching sphere. The case study presented here is situated in social network theory and investigates the technology-related conversations amongst academic staff in a higher education institution. The aim of the study is to interrogate the role that technology-related conversations may have on an individual lecturer's decision to use an educational technology: in this case, the adoption of the LMS. The study explicitly examines the types of conversations teaching staff have with one another in relation to their teaching practice and technology adoption. The application of social network theory in this study provides a rigorous approach to examining and revealing the types of interactions and relationships amongst individuals and the way information is exchanged between them (Haythornthwaite, 1996). As noted by Quatman & Chelladurai (2008), "we come to know and understand the social world by taking the relational components of phenomena into consideration" (p. 341). Everyone has their own network of individuals with whom they interact with and are "tied to one another by invisible bonds which are knitted together into a criss-cross mesh of connections" (Scott, 1998, p. 109). These networks can be complex and interdisciplinary, spanning both formal and informal organisational structures. This network complexity is well demonstrated by Roxå and Mårtensson (2009), who noted that academic staff can have significant networks consisting of conversational partners within and external to their formal academic departments. The authors concluded that academic staff converse with colleagues in their networks for testing ideas or solving pedagogical problems. However, their study explored lecturers' conversations in general, while

this study specifically uncovers technology-related conversations in particular. Revealing the types of conversations lecturers have with one another concerning educational technology can help inform senior academic leaders about the support mechanisms required for future technology adoption to occur.

Methods

The author of this paper reports on one particular aspect of a larger investigation about lecturers' technology adoption decisions, namely the types of conversations they have with colleagues in their social networks about technology matters. This qualitative case study is situated within the theoretical construct of social network theory and explores the types of technology-related conversations amongst lecturers in one particular academic discipline - second language teaching and learning. This particular sample population was chosen due to do its long history of integrating technology with pedagogy (Salaberry, 2001). While in an earlier paper, the researcher presented the findings pertaining to the relationship between lecturers' positions in their departmental social networks and the extent of their technology adoption (Mirriahi, Dawson, & Hoven, 2012), in this paper the researcher focuses on revealing how lecturers were initially introduced to the LMS and the sorts of technology-related discussions they continue to have with their colleagues.

Research Setting and Participants

This study was conducted at a research-intensive higher education institution in North America. This particular educational institution had adopted a LMS as an optional technology for academic staff to use to supplement their on-campus instruction from the late 1990s. Despite the considerable length of time since initial adoption of the LMS into the university learning and teaching setting, with the approach reflecting a transmission-style pedagogy, incorporation of the richness and range of complexity of the LMS functionality was rather limited. More simply put – the adoption of the LMS was centered on the upload and dissemination of course content such as readings and lecture notes. Furthermore, senior administration of the educational institution had begun to discuss strategies for expanding flexible and blended learning opportunities that leverage the affordances that technologies bring for student engagement through collaboration and communication tools (Cho & Carey, 2001; Levy, 2010). Hence, understanding the factors that have previously affected lecturers' adoption of the more transmissive-style tools within the LMS, could help drive strategies for future adoption of more socio-constructive technologies.

Through purposive sampling, all lecturers who taught in the disciplinary area of second language teaching in the 2011 academic year at this educational institution were invited to participate in the study. Twenty-three lecturers across three academic departments chose to participate in the study. The voluntary sample represented lecturers who incorporated a range of technologies in their teaching and who had varying levels of teaching experience.

Data Collection and Analysis

A qualitative approach was employed in order to conduct an in-depth and rich (Eisenhardt, 1989) exploration of lecturers' social networks and technology-related conversations. The data was collected through semi-structured interviews. The use of interviews as a data collection method provides participants with the opportunity to express and elaborate on their personal views concerning a situation (Cohen, Manion, & Morrison, 2007). In this case, semi-structured interviews rather than open-ended or completely structured interviews were appropriate for the study as the topic-initiating questions were derived from the research purpose, which therefore allows, for follow-up questions that can elicit more detailed information as required (Gay & Airasian, 2003). All interviews were audio recorded and the transcripts were sent to the participants for their review in order to ensure the transcription of the recoding accurately reflected the interviewees' intent (Carlson, 2010). Prior to the interviews, participants completed a pre-interview questionnaire to provide some background information concerning their adoption of the LMS and conversations with their colleagues, to help guide the interview questions. The final question asked the participants to indicate with whom in their academic department they spoke about technology. This information was used to determine the extent of the individual's social network (or conversational partners) within their department. A roster of names of the individual participant's colleagues was provided, in order to "lessen the likelihood that respondents will overlook certain of their relationships" (Stork & Richards, 1992, p. 205). Since there was limited information regarding their colleagues external to their academic department, the data collected to inform the researchers about their social network was focused only on their internal conversational partners. The interviews, however, provided the data on the types of conversations they had with colleagues external to their respective academic department.

The interviews yielded copious amounts of textual data that was coded and categorized into manageable

thematic clusters, facilitated by qualitative content analysis software, namely Atlas.ti. The codes used in the analysis were derived from the data responsively and subsequently aggregated and tallied (Stake, 1995). Information collected from the pre-interview questionnaires regarding with whom the participants spoke about technology in their departments was imported into the social network analysis software, Gephi. This tool allows for the development and analysis of network diagrams to illustrate participants' social ties with colleagues. Such diagrams, also known as sociograms, help illustrate visually the extent to which each participant engages with colleagues about educational technology. This information, coupled with their interview responses, helped reveal the patterns concerning the types of conversations, if any, they had with colleagues internal and external to their formal academic departments.

Results & Discussion

This research study had two primary foci. First, it sought to determine how lecturers initially heard about the LMS and second, it explored the types of technology-related conversations they continued to have with their colleagues. The purpose of both intents was to discover the potential that conversations amongst academic staff may have on their technology adoption decisions.

Introduction to the LMS

One of the initial guiding questions in the interviews requested the participants to share how they first heard about the LMS at their institution. Figure 2 shows the distribution of answers from the 23 participants.

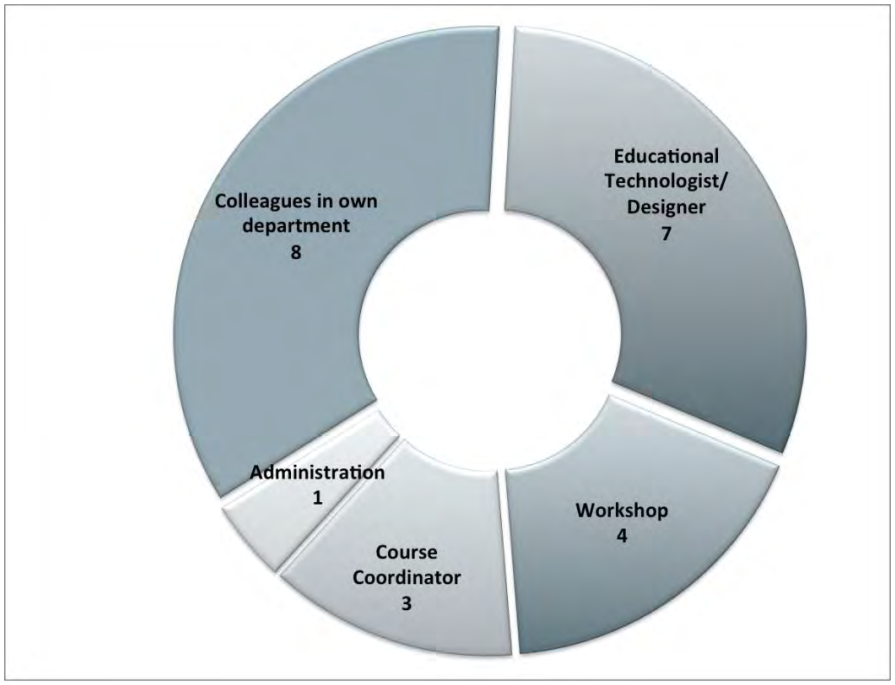

Figure 2: Distribution of how participants were introduced to the LMS

As illustrated in Figure 2, the most common ways that the participants in this study were initially introduced to the LMS was through colleagues in their own department or from an educational technologist or designer linked to their faculty or broader university learning support unit. Other participants heard about the LMS through workshop attendance, course coordinators who indicated which technologies they should use, or by being involved in the administration of the system. The results suggest that the informal conversations amongst colleagues and recommendations from an educational technologist or designer have been influential in the initial adoption of the LMS.

Social Networks

From the information provided in the pre-interview questionnaire, network diagrams or sociograms illustrating with whom the participants conversed about the technology within their department were generated. Figure 3

shows the ties that all participants had with their colleagues in their respective academic departments.

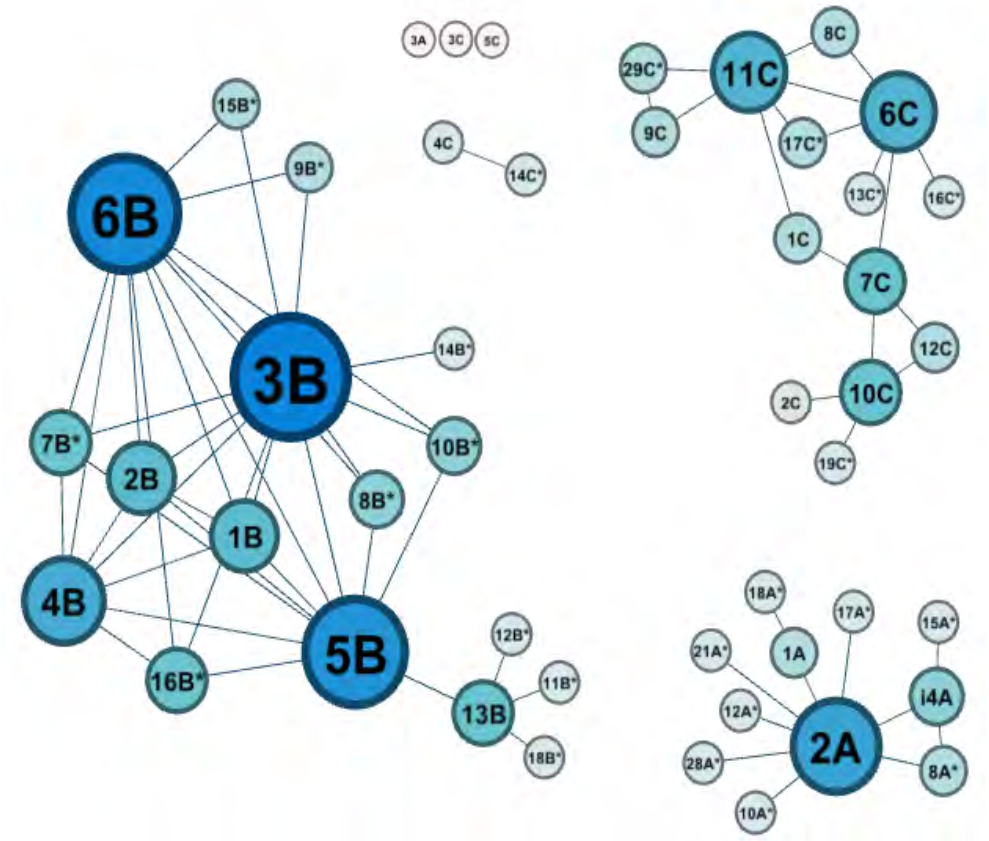

Figure 3: Sociogram of social networks of all participants

The nodes in Figure 3 represent the participants in this study and all colleagues in their departments with whom they indicated that they spoke about educational technology at the time the study took place. Non-identifiable codes are indicated in the centre of each node and an asterisk at the end of the code specifies that the particular individual did not participate in the study. The three clusters of nodes in the figure illustrate that the participants were from three different academic departments. The larger nodes with more saturated colour depict the participants who spoke to a greater number of colleagues than others, or, in other words, had a larger social network. Smaller nodes show that the particular participants had very few individuals in their network, or, in some cases, none at all. The three white nodes at the top of the figure represent this last group. Altogether, the sociogram in Figure 3 reveals that, while many of the participants had conversations with a number of colleagues in their academic departments, some had conversations with a very limited number, if any. The interview data therefore supplements the visual overview, by providing an in-depth exploration of the reasons why some participants may choose to not converse with others as well as the types of conversations the participants had with their colleagues. Furthermore, since the social networks are limited to the participants' ties with their peers in their academic departments, interviews provided information regarding the conversations they may have had with others external to their departments or institutions.

Types of Conversations

During the interviews, the participants were asked to elaborate on the types of technology-related conversations, if any, they had with colleagues in their department, as well as any conversations they had with others externally. Participants were encouraged to reflect on conversations they may have had in the past as well as conversations they continued to have at the time of the interview. They were further prompted to explain whether the conversations affected their decision to use a technology. Figure 4 presents a graph indicating the different types of conversations the participants mentioned having with colleagues internal or external to their academic department.

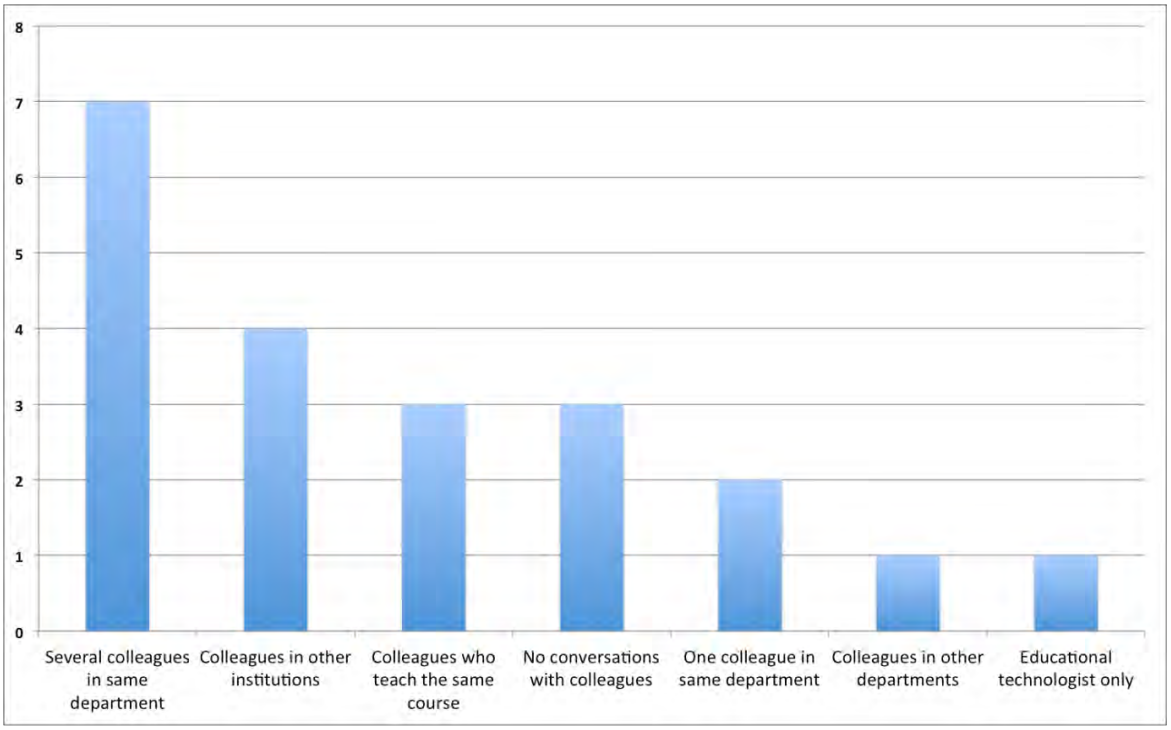

Figure 4: All types of technology-related conversations

As the graph in Figure 4 shows, there is a range in the types of conversations that occur internally and externally to the participants' academic departments. Seven of the participants indicated during their interviews that they had technology-related conversations with several colleagues in their department. This is also demonstrated in the social network analysis illustrated in Figure 3. The sociograms clearly identify seven nodes that were larger than the others and more saturated with colour, indicating the particular lecturers who had conversations with a number of colleagues in their department. Some of the participants noted that such conversations tended to occur informally amongst themselves. For example, one participant commented:

> With my colleagues we share the same office space so if we have time to see each other sometimes we talk about what technologies we can use. [10C]

Likewise, another participant noted that in addition to initially hearing about the LMS from colleagues, informal technology-related discussions continue to occur, although not regularly. As this participant states:

> Some of my colleagues have introduced the LMS to me, and I've been using it ever since. I occasionally discuss Vista with them, not regularly. [13B]

Both of these examples suggest that lecturers informally converse with one another about educational technology. Although the study by Roxå and Mårtensson (2009) was not focused on technology-related conversations specifically, it similarly revealed that university teachers have spontaneous private discussions about pedagogical issues with colleagues within their own academic departments. In addition to the conversations held within the department, out interview data revealed that some participants had conversations with colleagues external to their department. As shown in Figure 4, four participants stated that they had technology-related discussions with colleagues in other institutions and one individual had conversations with colleagues in other departments. One participant who had ties with others externally shared:

> I have plenty of support because I'm part of a trainer network for language teachers…so I meet up with that network maybe twice a year. They are very supportive. [5B]

Similarly, another participant noted:

> I'm not technologically inclined, but I seem to get my expertise and find interesting people outside of the department. [1B]

The participant involved in conversations with colleagues in other departments explained that being involved in a multi-department second language cluster provided opportunities for discussion with those who teach in other departments.

> With a colleague in my department, we co-chair a second language acquisition cluster so through that I do meet with other colleagues who teach languages. [4A]

These three examples illustrate that some lecturers join networks of language teachers external to their academic departments, that they feel would provide the support and opportunity to share ideas about effective technology integration into the curriculum. Although Niesz (2007) does not specifically write about technology-related networks, the three examples above resonate with her argument that teachers engage with networks that are responsive to their passions and interests and provide opportunities for critical dialogue and support. Each of the participants who had joined a network either external to the department or external to the university, had chosen to do so because of the support and expertise available in such teacher networks. However, unlike the participants who conversed with colleagues in networks outside of their department, others limited their conversations to fellow lecturers who were responsible for teaching the same course. During the interviews, three of the seven participants who had indicated on their pre-interview questionnaire that they spoke with a number of colleagues about technology, clarified that their conversations were predominantly with colleagues who teach the same course and occur regularly once a semester. As one participant stated:

> We get together regularly as teachers, we have meetings at the beginning of term and at the end of term and we certainly discuss it [technology] then. [3B]

Regularly meeting with colleagues to share and discuss technology integration into the curriculum relates to some of the responses in Mwaura's (2003) study indicating that some lecturers demonstrate technology use to one another during departmental meetings. The participants that appeared not to have technology-related conversations with their colleagues are represented in Figure 3 as isolated nodes (3A, 3C, 5C). One of these participants elaborated during the interview that the lack of conversational partners was due to an over-reliance on support staff, such as the educational technologist. This is well illustrated in the comment that:

> Because we have here in the department a technician who supports us when we start the course and when we want an online component, he will do the training for us. [3A]

This is consistent with previous studies that revealed that technical staff provided the necessary support and training to increase technology use (Kessler & Plakans, 2008; Mwaura, 2003). The other remaining isolated participants also explained their reasons for not engaging with their colleagues about technology issues. One participant noted:

> I just explore it myself for my own fun, that's about it. [3C]

Similarly, the remaining participant commented:

> My predecessor for the other course is away…and we already have all the tools so we really don't talk about it. [5C]

In addition, two of the participants noted in their interviews that they only speak to one other lecturer in their department. One of these participants commented that this was due to only one other person having the same technical knowledge, as described in the following statement:

> I'm probably the first person to get a PC or actually to get a Mac…although somebody younger like 14C was the one that put me on to the software for films so I mean 14C is at least up on these things as I am. [4C]

In claiming that the choice to use a particular software for language films was due to hearing about it from a fellow lecturer who is equally as knowledgeable, participant 4C reinforces the findings of Oncu et al. (2008) which suggested that meeting with technically-advanced colleagues enables teachers to learn of the potential of new or unfamiliar technologies. Similarly, the other lecturer who had minimal discussions with one other colleague also explained that this was due to being technically inclined and preferring to speak with educational technologists instead. This participant stated:

> I think generally speaking I'm good at learning computer things, software…I like to learn from professionals in the computer area and, so, I don't really do a whole lot with my colleagues. [2C]

This example shows that the participant felt fairly confident about using technology and received training from expert technical staff. This is consistent with the findings of Kessler and Plakans (2008) indicating that highly-confident teachers credited their degree of comfort in using technology to their personal interest and previous attendance at technology-related classes. Therefore, the anecdotes from the participants show that generally those who had limited conversational partners or none at all, considered themselves to be technically advanced and preferred to speak with experts, either more experienced colleagues or educational technologists.

Implications

The findings from this case study yield two revelations that begin to address the factors contributing to lecturers' technology adoption decisions. First, the interview data indicates that the majority of the lecturers participating in this study initially heard about the LMS from colleagues or from an educational technologist. Due to the limited sample size, such conclusions cannot be generalized to the broader population, but they shed light on their potential influence. Senior administrators interested in diffusing a new innovation or technology across their campus may consider investing in educational technologists who can be readily available to share information about the affordances with academic staff. Furthermore, such an investment can continue to have impact as the innovators or early adopters share their experiences with others, introducing them to the new technology and contributing towards further adoption. Second, a combination of the pre-interview questionnaire data concerning the participants' social networks, coupled with their interview responses, shows a trend towards lecturers having technology-related conversations with a number of colleagues both internal and external to their academic department. While some of these conversations occurred regularly on a more formal basis, such as lecturers teaching the same course meeting once or twice a term, others occurred more informally in shared offices or by meeting lecturers who teach elsewhere.

Regardless of whether the conversational ties are between colleagues in the same department or with others externally, the findings from this study, disclose the trend for lecturers conversing with one another about technology and, in some cases, seeking advice from one another. This analysis resonates with the conclusions drawn from previous technology adoption studies reporting that communication amongst academic staff influences technology adoption (Davis, 2005; Mwaura, 2003). It further supports the work of Roxå and Mårtensson (2009) suggesting that the social networks of academic staff do not have departmental boundaries but rather, they establish *conversational partners* with those they can trust and with whom they can discuss pedagogical issues. Higher education leaders, therefore, who are interested in expanding technology-enabled learning at their institutions, may consider devising policies that encourage lecturers to expand their social networks leading to a greater exchange of ideas, strategies, and support. For instance, greater funding for attending professional development or networking events, or opportunities for lecturers to collaborate on course or curriculum development may foster relations that will instigate knowledge sharing and support for technology-enabled learning. Formal mentorship arrangements amongst novice and expert technology users may also advance technology adoption or more sophisticated integration of it in teaching practice across the institution. While this study begins to reveal that exploring the ways that academic staff were initially introduced to previous technologies, namely the LMS, can help inform decisions on technology diffusion in the future, it further contributes to the literature by providing a glimpse of the social networks and the range of conversations and ties that teaching staff have with one another. Determining how lecturers share and receive information about technologies today can help establish future policies and strategies that will gain support and advance technology-enabled learning in higher education.

Next Steps

Since the design of this case study resulted in a small number of participants from a single higher education institution and represented a specific academic discipline, second language teaching, the findings are restrictive to the sample population and cannot be generalized broadly. Expanding the study to other higher education institutions and comprising of participants from a range of disciplinary contexts, would allow for cross-comparison and greater applicability. In addition, while the qualitative study design allowed for an in-depth exploration into the types of conversations occurring amongst lecturers and the reasons for the lack of relational ties for some of the staff, future studies can have a larger scope and sample size with a focus on social network analysis. Investigating the social networks of a larger and more diverse sample population will allow for comparisons and trends to emerge concerning the way information flows and knowledge is transferred amongst academic staff. This could then be used to inform institutional strategies. While this study focused on with

whom the lecturers spoke about educational technology, it is worthwhile to extend the study to explore why some types of conversations may have a greater impact on technology adoption. Delving deeper to understand lecturers' perceptions of why they consider certain types of technology-related conversations more valuable than others will provide greater insight into the types of professional relationships and environments conducive for engaging in such discussions. Lastly, the intent of this study was to discover the extent and range of technology-related conversations amongst lecturers occurring face-to-face. The digital connections that academic staff may have with one another were not explored in this study. Future studies could expand the notion of lecturers' social networks to include the electronic ties they have with colleagues through networking sites such as Facebook, LinkedIn, Twitter, and discipline-specific online networks and discussion forums. This may help establish a more accurate depiction of their social network and technology-related conversations, whether in-person or electronically, that spur innovation and enhance technology-enabled learning and teaching. While this study begins to reveal the *backstage behaviors* (Goffman, 1959) of academic staff in relation to their informal conversations about technology, further research in the area of social networks, informal conversations, and technology adoption can advance understanding of the socio-cultural factors underpinning the *diffusion of innovation* (Rogers, 1995) in higher education.

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