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Knowledge Sharing Challenges in University-NGO Collaborative Project

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Full research paper

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Abstract

This research is based on a qualitative approach with in-depth case study using Nonaka's theory of knowledge creation. It addresses the high-level need to make collaboration more effective between university and NGO by exploring knowledge sharing challenges. It used semi-structured interviews, and project documentation to look at the ways in which researchers and NGO representatives with different culture within University-NGO partnerships share information and knowledge. The study will propose guidelines that reflect five key steps which are important in order to show how collaborative projects can build a successful knowledge sharing environment.

Keywords: Knowledge sharing, knowledge sharing challenges, University-NGO collaboration, collaborative project, knowledge creation theory.

1 Introduction

The literature on knowledge creation shows that knowledge sharing is an important but complex process in university–NGO collaboration (Olivier et al. 2016; Pineda et al. 2009). Knowledge sharing can be defined as "activities of transferring or disseminating knowledge from one person, group or organization to another"(Lee 2001, p. 324) and is considered a process or activity leading to both individual and organizational learning (Andrews and Delahaye 2000). The definition of knowledge sharing is not limited to organisations. For example, Parekh (2009) considered knowledge sharing as activities through which information, skills and expertise are exchanged among individuals, a community, an organisation or collaborative parties Others have defined knowledge sharing as a dual process of not only acquiring knowledge but also contributing to knowledge production through activities such as "learning-by-observation, listening and asking, sharing ideas, and giving advice" (Bosua and Scheepers 2007, p. 95). All of these authors emphasised interaction between individuals.

Opposed to this, Knowledge transfer has been defined as "the movement from its point of generation or codified form to the point of use" (Grover and Davenport 2001, p. 8) within a specific context such as learning that happens in midwifery through face-to-face practice (Bosua and Scheepers 2007). Bolisani (2008, p. 112) defined knowledge transfer as the process through which a "piece of knowledge" is passed via medium or channels from somebody to somebody else. In the majority of studies, knowledge transfer is defined as the process in an organisation through which different departments, groups and divisions interact and learn from the experience of others (Easterby-Smith et al. 2008). In these contexts, knowledge transfer can be referred to in terms of legal structures such as strategic alliances and networks, including R&D coalitions, franchising, co-production agreements, licensing and joint ventures (Easterby-Smith et al. 2008) and collaborative projects through which stakeholders learn from each other's experience. In university–industry/NGO collaboration, various structures are used as a context for knowledge transfer, including collaborative research projects, contract research, joint supervision of PhDs and community-based research.

The current research explores knowledge sharing challenges between individuals, groups and organisations within collaborative projects. In the current research, knowledge sharing is defined as either a process of exchanging and sharing individually held knowledge in tacit and explicit forms with other project members within a collaborative project structure, or exchanging and sharing knowledge produced by the project with the main organisations and parties who were involved in establishing the project, and relevant wider audiences.

University–NGO collaborations are relationships between NGOs and their practitioners and academics, based on shared objectives and interests and, in particular, are a means of social action and policy practice through the generation of solutions to community problems and concerns (Strier 2011). University–NGO collaboration has been described as "a win–win situation in which NGOs provide access to empirical experience and evidence, and the academic partner brings theoretical framing and methodological expertise" (Aniekwe et al. 2012, p. 4). NGOs' use of the knowledge thus produced can improve their practices (Hayman et al. 2016), while universities can access skills, competencies and capabilities in practice (Yaziji and Doh 2009). Although challenges in university–industry/NGO partnerships and knowledge sharing processes have been identified in previous studies, as will be discussed in the next Section, the literature review shows that the barriers and drivers identified in university–industry/NGO partnership have mostly been discussed in terms of the establishment of collaboration and partnerships, rather than knowledge sharing mechanisms at the individual level. There is thus a need to investigate the factors which impact on knowledge sharing success at that level from participants' perspectives.

There is also little research into KM within NGOs' and how they communicate with academics during collaboration. This paper focuses on knowledge sharing challenges in geographically distributed university-NGO collaborative projects that lead to use virtual collaborative spaces. Consequently, this paper aims to answer the research question "What are the barriers in the knowledge sharing processes of university–NGO collaborative projects from participants' perspectives in Australia?".

2 Knowledge Sharing Challenges

The nature of the barriers to knowledge sharing in collaborative projects has been well studied. Van Wijk et al. (2008) explored the factors affecting knowledge transfer in interorganisational collaboration after reviewing and analysing 75 papers. Factors impacting on knowledge transfer included absorptive capacity, ambiguity, cultural differences, differences in goals, trust and tie-strength. Pineda et al. (2009) explored the manner in which the particular characteristics of the university and industry and their

socio-cultural contexts prove to be significant impediments to collaboration. Attia (2015) categorised the barriers affecting university–industry collaboration into two groups: orientation-related and transaction-related barriers. Orientation-related barriers refer to the motivations and concerns of academics in collaborating. For example, academics might delay or even not publish the results of collaborative projects due to commercial considerations or the confidentiality of the industry research. Transactional barriers refer to "factors that can create noteworthy transactional costs to collaboration to industry" (Attia 2015, p. 17). Brohman et al. (2003, p. 98) studying a partnership between two universities and an NGO in Mexico identified issues in three categories, namely, "structural constraints rooted in the relationship between partners and the principal funder; structural constraints based in the internal constitution and procedures of the two universities; and differential needs and interests between the universities and NGO". They also found barriers related to distance, language and culture.

Finally, Olivier et al. (2016) organised NGO–researcher partnership challenges into four categories (p.447): 1) asymmetrical power relations linked to perceptions of unequal knowledge, competence and resources – for example, NGOs have less methodological knowledge concerning study design compared to academics; 2) divergent goals and approaches linked to the priorities of the partners and which may bring tensions in collaboration because of the different expectations that researchers and NGOs may have regarding the results of research; 3) lack of recognition for the contributions made by each partner linked to partners' quality in doing research – academic researchers are more aware of the standards of methodological and scientific rigour, while NGO members have pragmatic considerations in doing research; and 4) impediments to respect within partnerships linked to impediments in establishing a collaborative environment for partners to pursue their goals within the partnership.

3 Research methodology

This study seeks to explore knowledge sharing challenges in collaborative projects, that is, interorganisational contexts. Different shared contexts can emerge within collaborative projects based on participants who have different experiences, ideas, skills, passions and tensions. These relationships are not fixed, but depend on context. The current study fits within the interpretivist paradigm, consistent with previous studies, because in order to fully capture knowledge sharing challenges it uses participants' opinions and perspectives about how knowledge is shared in collaborative projects.

As the aim is to explore knowledge sharing challenges in the context of university-NGO collaborative projects, the knowledge creation model developed by (Nonaka 1994; Nonaka and Takeuchi 1995), and especially the concept of Ba, is used as a theoretical framework. Ba is a context in which knowledge is shared, created and utilized. Ba can be "physical (e.g., office, dispersed business space); virtual (e.g. email, teleconference); mental (e.g., shared experiences, ideas, ideals); or any combination of them"(Nonaka and Konno 1998, p. 40). Four types of Ba can be defined, according to their role in the knowledge creation process: 1) Originating Ba is the primary Ba in which the knowledge creation process begins and offers context for socialisation; 2) Interacting/dialoguing Ba in which tacit knowledge is converted into explicit knowledge; 3) Systemising Ba in which collective and virtual interactions are characteristic and explicit knowledge can be converted into other explicit knowledge and further disseminated; and 4) Exercising Ba, in which explicit knowledge is converted into tacit knowledge(Nonaka and Konno 1998).

Understanding the different characteristics of Ba in collaborative projects and how active actors interact within each Ba can facilitate the development of new insights into knowledge sharing. In this study, the framework is used together with an in-depth case study method to explore knowledge sharing challenges in a university-NGO collaborative project. A case study provides a means to understand social phenomena in their natural settings or context (Darke and Shanks 2002). It is a comprehensive research strategy comprising the logic of design, data collection techniques and specific approaches to data analysis (Yin 2003), and is the most common qualitative research method within the IS discipline (Shanks and Bekmamedova 2013), using multiple source of evidence to understand the nature and complexity of existing processes (Benbasat et al. 1987).

Ethical approval with project number 9895 was acquired from Monash University Human Research Ethics Committee on 20/07/2017. Data was collected through semi-structured interviews and the analysis of project documentation, including minutes of meetings, official reports, and any other available documents which we had permission to access. Participants were asked about what sort of knowledge they shared, how they shared knowledge, how they created shared collaborative spaces, which spaces and tools they preferred for knowledge sharing, limitations/difficulties in sharing knowledge and the barriers to knowledge sharing. The questions were revised and modified after conducting the first interview to ensure the relevance and clarity of the questions.

As the focus of this research was the relationship between the NGO and the university, we interviewed those project members who were directly engaged in collaboration. In total, 16 out of 35 participants were interviewed between November 2017 and August 2019 including nine academics, four participants from the NGO (Bangladesh branch), two participants from the NGO (Australian branch), and one associate researcher from Rome. We interviewed participants twice. After the first round of interviews, we analysed the interviews based on the model and gained understanding about which areas needed more clarification. We then attended meetings (face to face and via video) and examined related documents. That in turn enabled us to better understand the project context.

Thematic analysis was selected as the data analysis method. There are two basic approaches to conducting thematic analysis. One approach is that themes are determined in advance by existing theory and are reflected in the interview questions (theory-driven); the other approach is a flexible approach to coding and theme development. The codes emerge from the data (data-driven) and exact words used by participants (Nvivo codes) (Terry et al. 2017).

In coding, we primarily used the data-driven approach to see what emerged from the data. We initially coded using the exact words used by participants, rather than pre-existing codes. However, the original list of questions that was developed from the literature acted as a form of guide to the discussion. We were aware that this may have introduced a level of bias, both during the interview and the analysis of the transcripts. Coding using the terms used by the participants was used so as to be guided by their ideas not any preconceived ideas obtained from the literature. After the initial coding, we reviewed the codes to determine whether the codes were still relevant to the transcripts. Therefore, irrelevant codes were deleted, some codes were merged with other codes, some codes were modified, some codes were moved to new places and some overlaps were removed.

For the next level of coding, we consulted the literature, the conceptual framework and the research questions to improve the level of robustness. Therefore, the codes and themes were determined by a mix of a data-driven approach, based on familiarisation with the data, and a theory-driven approach, based on the literature, conceptual framework and research questions.

Interviews with academics were conducted in face-to-face meetings in their offices, while NGO representatives were interviewed via Skype, Zoom and phone. The duration of the interviews ranged from 40 to 80 minutes. All interviews were recorded and transcribed verbatim. The recorded interviews were then entered into the qualitative data analysis software NVivo 12.

4 Case Study Context (ProjectNGO)

ProjectNGO was a 5-year collaborative project between a university and an international community-based aid and development NGO with branches in Australia and Bangladesh. Starting in 2015, it investigated information system (IS) design and socio-technical questions related to the adoption and adaptation of new technologies. It was a participatory action research (PAR) project and the outcomes were expected to include recommendations on managing PAR projects and developing information management systems for resilient farming in Bangladesh. It was not conceived of as a single project but, rather, as a group of related sub-projects including PhD research, and research on information literacy.

For the core project, 100 smartphones and phone credit were given to women farmers in each of three villages in Bangladesh. The women farmers were trained in the use of smartphone applications. This provided a number of benefits for the women. For example, the women were trained to access agricultural and fishery information related to crops, rice cultivation, fisheries, livestock, poultry and general horticulture via their smartphones. This information was provided through a commercial telecommunications company via an app which also incorporated information relevant to the local community. Women could call back for free if they needed further information and advice.

This project had complex structures using different collaborative technologies. The research team was split between Australia and Bangladesh. The university, located in Melbourne, Australia, was responsible for the governance of the project and designing and undertaking the research. A researcher from Rome was also engaged on the project. The Australian branch of the NGO was responsible for the administrative aspects of the project, including contract management. The Bangladesh branch of the NGO was responsible for field implementation, working with a number of partners, including local NGOs, a commercial telecommunications company and a number of Bangladeshi universities. However, the primary focus of this case study is the interaction between the university and the NGO.

5 Findings

Organisational culture differences, language differences, telecommunication access, time, lack of written documents of the procedures, lack of knowledge capture and lack of organised research datasets were found to be the main challenges that occurred during knowledge sharing.

5.1.1 Organisational culture differences

The main aim of an NGO is to solve community problems through practical outcomes. It allows interaction throught research procesess (Aniekwe et al. 2012). In the current study, the NGO conducted research from a project evaluation point of view, rather than the theoretical work and type of knowledge creation that universities are interested in. As a result, the theoretical components of the research was not very important for it.

Misunderstanding of the need for high quality data was a barrier in ProjectNGO. The international NGO does conduct research, but usually with a more directly practical focus and outcome than the university. The international NGO understood the need for quality data but not necessarily what quality meant for some of the theoretical aspects. There was often a tension between theoretical and practical outcomes, the problem being exacerbated by the number of groups involved in data collection including additional organisations that did not have such a strong understanding. This long chain of organisations with different cultures and knowledge created difficulties in data collection, however, the research team was aware of these issues and had to come up with ways to work around the problem.

In ProjectNGO, a large part of knowledge in the NGO was tacit. Those involved in knowledge sharing included project team members, translators, community members, Bangladeshi universites, community-based organisations etc. In addition, the main NGO did not conduct project research in the field with its own staff but used Bangladeshi universities and specific local community-based organisations for data collection and community contactAs a result, the NGO had difficulty in collecting accurate data because each organisation, specifically the community-based organisations, had a different set of priorities, skills and experiences in contacting communities.

A university creates knowledge and builds theory to use in practice and is willing to share the produced knowledge with different stakeholders and publish it for different audiences. Publication in high-impact journals and acclaim by peers in the specific field are means of success for them. In the current study, the university had its own organisational structure and culture. The academics had freedom in doing research. However, for creating online shared space for collaboration with the NGO and using university infrastructure, academics needed to follow their own organisational principles and processes. For example, getting permission from the IT department of the university to create a shared space took time. In contrast to academic freedom, the academics also needed to follow university policy in accessing and using facilities.

5.1.2 Language differences

Language differences were mentioned as one of the most important challenges to knowledge sharing. These differences can be divided into two main categories: foreign languages and discipline/subject languages. Project members knew English and it was the main language for starting communication. It was a second language for the NGO members, who spoke Bengali, and the associate academic researcher, who spoke Italian. The NGO members in Bangladesh wrote documents and reports in English. Written communication was in standard English. However, they communicated verbally in Bengali within the NGO. Their version of spoken English was unfamiliar to the team members based outside Bangladesh, and this sometimes lead to misunderstanding during communications, particularly in the virtual spaces (Ba) which the project members relied upon for day-to-day communication.

Data collection tools such as questionnaires were developed in English and then translated into Bengali. They were administered in Bengali and the responses were in Bengali, which then needed to be translated back into English. The data in the field was collected by NGO people who spoke Bengali, then translated into English as the academics did not know Bengali. Furthermore. the university researchers (apart from two of the doctoral students, who are Bangladeshi) did not have unmediated access to the women because of language issues and this created the potential for additional problems. It is worth adding here that this issue also relates to the data collection tools, understanding the purpose of the data collection and the meaning of the data to be collected. The lack of subtlety in translation for the NGO project was mentioned as a foreign language challenge. It was quite possible that something was missing in translation. Although the academics were aware of this issue and worked to minimise the issue, the speed of both verbal and written communication slowed project progress.

Difficulty in understanding each other was also mentioned as a barrier to knowledge sharing in initial stages. It seems that this barrier also emanated from cultural differences between the university and NGO because of the different aims of the research, languages, contexts and national cultures. In ProjectNGO, the academics used more jargon (discipline/subject language) and complex language in communications which were sometimes meaningless for the NGO members because they used their own language which was based on practice and was more conversational. The lack of shared language was mentioned as a major challenge in this collaboration and considerable time was spent on developing a shared language

5.1.3 Telecommunication access

Telecommunication access was mentioned as one of the most important challenges for knowledge sharing. Being an international project, the project spaces (Ba) established to facilitate day-to-day communication were heavily dependent on communications applications, including video-conferencing applications, such as Zoom and Skype, and email. Telecommunications issues at the Bangladesh end caused a number of problems. For instance, the sound quality in online meetings was often poor, and even affected phone calls when used as a back-up strategy. This was a frequent problem, leading to miscommunication in some meetings. In response to this challenge, project members after online meetings followed up by email to confirm understandings or actions, and minutes of meetings were produced and shared quickly, sometimes adding extra workload.

5.1.4 Time

Time limitations were raised as an important barrier to knowledge sharing. Time can be divided in this study into three main categories: lack of time at an individual level, time orientation and time zones. Almost all participants had conflicting work priorities. Academics lacked time because they needed to focus on their students, teaching and other administration tasks. The NGO members worked simultaneously on different projects. Managing time was difficult for them because other priorities could sometimes take precedence. They either could not attend meetings or did not have sufficient time to prepare properly. As a result, they needed to allocate limited time for each of the projects.

Time orientation was mentioned by participants as a challenge in collaboration and knowledge sharing. The nature of the research required significant time for completion. For example, the doctoral students' research under the ProjectNGO was scheduled for a three- or four-year span, potentially raising a conflict with the NGO's desire for short-term results. To deal with this issue, the NGO requested that doctoral students prepare quarterly progress reports. However, this was difficult, especially in the first year of study as the doctoral students were still working to define and scope their projects. This time orientation can be considered under organisational culture because it refers to different objectives that each of the organisations followed in collaboration.

5.1.5 Lack of knowledge capture

There were inadequacies in the process of capturing knowledge. The knowledge that members gained during collaboration went with members when they left the organisation or project. Staff turnover is a main reason for this challenge because it brings difficulty in tacit knowledge capture. There was no clear policy in the university or the NGO for capturing tacit knowledge, and so informal ideas and common understandings were lost as members left both parties.

The lack of a local audience in the university was mentioned as another reason for the lack of experiential knowledge capture by one of the academics in ProjectNGO. Again, this barrier refers to organisational culture. The university was interested in publications in high-quality journals, not talking informally about experiences. The associate researcher in ProjectNGO also explained this issue as a different requirement for the NGO and the university.

It is worth adding here that collaborative research projects in a university work in isolation from other research groups. Since a small number of researchers are working in any particular area, the opportunities for sharing the gained knowledge with other groups are limited. The areas of interest and expertise of members of each discipline are also different, which can result in less interest in other collaborative research projects.

Capturing and sharing the tacit knowledge of the project members was an important part of the knowledge sharing mechanisms. Lack of knowledge capture was a common issue for ProjectNGO, it seems partly because the tacit nature of this kind of knowledge makes it difficult to capture and partly because of the lack of clear policies in the NGO and the university. In addition, collaborative projects evolve over time and may experience changes as projects progress, bringing instability in capturing and

sharing knowledge. Having clear policy from initiation of the project in order to capture gained experience would be a solution.

5.1.6 Lack of written documents of procedures

In the current study, the NGO had a very well-developed system of documentation and KM to support high-level project management, evaluation and transparency. However, it had a problem in documentation of what happened in the field, especially documentation that related to the collection, management and understanding of research data. Therefore, documentation of the procedures was mentioned in ProjectNGO as one of the barriers to knowledge sharing. It seems that in this project, as the academic emphasised, the NGO had lacked all the necessary skills in managing, storing and organising data relevant to the research.

5.1.7 Lack of organised research datasets

Members in the NGO and the university were interested in obtaining information about primary research datasets, data interpretation and analysis, and any relevant material regarding the research. Each body had their own policy in organising the research datasets of the project. There was no standard framework even within each body for organising research datasets. Official information such as research proposals, meeting minutes and contracts, was stored. Research datasets about the process were organised in the NGO and the university in their own repositories. The NGO used Box to store their datasets. Google Drive was used to facilitate sharing research datasets between members of the project at the university. Based on researchers access and observations about Drive, there was no consistency in organising files and folders. Although a research data management plan was prepared as part of the ethics application, and clearly discussed storing and managing research datasets, it was difficult to implement in practice because the researchers thought it useful to have working copies on their own computers for ease of access and manipulation, giving less thought to long-term authoritative data sets.

However, based on researcher's analysis of discrepancies in the responses of the academics and NGO representatives, it seems that there was no clear policy for recording the research datasets in the NGO. It just stored everything related to not only this project but also every task in Box, without any organisation. For this reason, sometimes getting to a specific document took time for the NGO members and there were many important datasets there and members were not aware of them.

6 Potential guidelines

From the results of this in-depth case study in identifying knowledge sharing barriers based on active actors' perspectives, proposed guidelines have been developed based on the communication occurring in university–NGO collaborative projects in the IT faculty.

These guidelines for effective knowledge sharing in university–NGO collaborative projects have been drawn from one project only, and provide only a starting point which could be expanded upon with further study. Having said that, the proposed guidelines reflect five key steps which are important in order to show how collaborative projects can build a successful knowledge sharing environment.

Step one: addressing generic issues. Many of the major barriers that emerged from the case study have been generic issues related to managing collaboration project. This applied in the contexts of the university–NGO. The factors that are essential to address are active actors, time, physical place for communication, clear KM policy (university and NGO need to create a strategy to build, maintain and utilise the project's knowledge assets effectively after finishing; universities and NGO should create a condition that enables members to know where information is located, where knowledge is accumulated and how information and knowledge can be accessed), KM tools and ICT infrastructure. These basic factors should be clear from the outset of the projects.

Step two: collaborative project definition and balancing the requirements. The projects are defined so as to ensure the relevance of the topic to the partners. In this step, the active actors, mostly the main connector, play major roles in defining the project and topic. Negotiation among different stakeholders, between partners and leaders, needs to start before developing the project proposal. A balance between the requirements of industry and NGOs and those of the university must be achieved if partners want to have successful knowledge sharing mechanisms. The needs of each party and associated limitations must be clearly identified and agreed among partners. Balancing the requirements leads to achieving mutual benefit that is strongly dependent on successful knowledge sharing. Cultural differences and expectations of the partners need to be clearly discussed in order to achieve a balance between university, industry and NGO priorities and needs. Each partner can provide solutions or training in the area of limitation during collaboration.

Step 3: Starting collaboration and developing shared collaborative spaces for communication. In the context of university–NGO collaborative project, virtual spaces and ICT are essential for building virtual shared collaborative spaces in order to start the communication. Having understandable scope, common goals, clear timelines, clear objectives, understanding of cultural differences and specific room for discussion should be considered in developing SCSs.

Step 4: Providing feedback. This means providing feedback in a short time in explicit and tacit forms such as regular reports or workshops and seminars. NGOs need short-term results. Having pre-established forms for reports or guidelines for running seminars and workshops can improve this step. Each partner needs to be flexible in reacting to provide feedback during collaboration. This includes the ability to change the project direction and strategy.

Step 5: Capturing project experiences. A knowledge repository is required in order to create an environment that captures project members' knowledge and experience in different formats. This database can create a virtual treasury for university and NGOs when starting other collaborative projects, and enable collaborative memory. The university and NGOs may require an information and record-management role to design this databank. This role needs to identify and capture the information, knowledge and experience gained during each specific collaborative project to support NGO and university performance in doing more collaborative activities.

All of the five steps mentioned above need to be heeded if knowledge sharing is to be improved in collaborative projects.

7 Discussion

This study used Nonaka's knowledge creation model, and particularly the concept of Ba, to understand the ways in which the development of physical and virtual communication spaces for the project impacted on the sharing of tacit and explicit knowledge, and so the management of the project. Space limitations preclude a full exploration of the mechanics of those processes in this paper, but it is clear that ProjectNGO, as an international project operating across a number of time zones, was heavily reliant on telecommunications applications and that difficulties in harnessing these effectively had contributed to exacerbating many of the issues discussed below. The difficulties encountered were not necessarily due to the applications themselves, but were often a result of having to negotiate language differences and understandings, competing perspectives and priorities in a situation where not only many of the participants were time-poor, but had to contend with inefficient communications channels due to weak telecommunications infrastructure. While time zones differences resulting in meeting and work problems were not a major issue, our observations confirmed the effect of time zones differences as a problem in organising meetings. In addition, although telecommunication technology facilitates long-distance collaboration by offering access to large amounts of data and information (Riege 2005) there were many problems in managing online meetings because of telecommunication issues in Bangladesh. See Dehghani (2021) for a more complete discussion of these issues and the application of the theoretical framework.

As found by (de Wit-de Vries et al. 2019), cultural differences may reflect, and be reflected in, differences in goals, outcomes, visions, research activities, the allocation of time, management styles, social conduct, languages, national cultures and time perceptions. In this study, the NGO and university were found to differ considerably in their underlying values, beliefs and processes, and interviewees mentioned different work routines, time frames, research aims and organisational cultures, languages as well as difficulty in understanding each other. All of these represent barriers to knowledge sharing. These are important findings because, as noted in the literature, organisational culture can have a significant influence on the success of project performance (Coffey 2010) and on members' knowledge sharing and learning behaviours (Wiewiora et al. 2013).

Organisational differences have a direct impact on knowledge sharing. A university has an explorative nature, while NGOs have problem-solving natures. Based on their objectives and structures, they prioritise different tasks. Universities are often interested in long-term results and publication of findings, while NGOs seek short-term outcomes to use in practice (Aniekwe et al. 2012). Such differences in missions and objectives were reflected in this study: the NGO was primarily interested in the data from a project evaluation point of view, while the university researchers focused on theoretical research outcomes.

The study has indicated that a lack of organised research datasets was another barrier to knowledge sharing. In the literature, a previous study confirmed that the lack of research data on NGO activities creates difficulty in designing and implementing projects because of a lack of understanding and

identifying relevant knowledge on basic issues such as the types of development activities that NGOs are involved in (Mungate and Mvududu 1991).

In a previous study of knowledge sharing among high-tech companies in China and India, working in a foreign language was mentioned as a barrier to knowledge sharing in that meaning was often lost (Teagarden et al. 2008). Similarly, with ProjectNGO, as fieldwork was conducted in Bengali, a lack of subtlety in translation and the development of data collection tools such as questionnaires emerged as a barrier, as in some areas the translation was not always of sufficient quality for the researchers.

Discipline and subject languages relate to differences in knowledge backgrounds between the university and NGO, with academics using more complex language based on the needs of the research and their discipline (Pineda et al. 2009). Consistent with prior research, this study shows that in an interorganisational context such as organisational collaborative projects, shared language, and a capacity to theorise, eases communication and knowledge sharing.

According to the literature, collaborative projects face challenges related to information management and knowledge sharing. In particular, when a project is finished its content typically disappears because collaborative projects are time-limited settings and no resources are allocated to organise the produced knowledge for reuse despite the fact that organisational learning is dependent on knowledge creation and sharing of the produced knowledge of collaborative projects (Almeida and Soares 2015).

In our study, the NGO demonstrated its capacity in documentation related to project management and accountability. On the other hand, there was a paucity of written documentation of the procedures, day-to-day operational activities and research information, creating a potential barrier to knowledge sharing which reflected the NGO's view that documentation of procedural knowledge was not a priority.

The risk of knowledge loss, specifically tacit knowledge, at the end of the collaboration was a serious challenge for the university and the NGO. In this study, ProjectNGO members had their own structures for organising information and knowledge. The capture of codified and explicit knowledge was seen as important for two reasons: first, organisations needed to record the explicit knowledge for their own internal report and organisational learning, and second, organising explicit knowledge is easier. However, project-related knowledge such as skills, insights, collaboration experience and personal motivation which are key in knowledge sharing were not captured well in the ProjectNGO as capturing these processes were not given the same priority as capturing other organisational processes in either the NGO or the university. As a result, there was a lack of KM processes to record and capture explicit and tacit knowledge. These findings are consistent with previous studies (Fong and Kwok 2009; Landaeta 2008).

Local cultures and cultural differences were at play in ProjectNGO. Academics needed to adjust to the Bangladeshi social and institutional culture, and this meant considerable travel and time spent establishing mutual understanding. It also made online meetings complex, since mutual understanding across 'noisy' Skype, Zoom or phones was sometimes very difficult to achieve. This finding confirms the research of Allali (2016) who explored knowledge sharing among ICT firms in Libya and found that Libyan culture was a major barrier to creating sharing culture. However, Bangladeshi culture was not explicitly mentioned as a major barrier for ProjectNGO, possibly because academics spent time learning about the dynamics of the Bangladeshi culture, overcoming some, but not all, barriers.

This finding also confirms previous studies which have mentioned that cultural distance increases the cost of entry (Palich and Gomez-Mejia 1999) and operational difficulty (Mowery et al. 1996) and can lead to misunderstanding and limited sharing of core knowledge components (Lyles and Salk 1996). It can also negatively influence relationships because it limits the creation of personal ties and direct access to people (Wendling et al. 2013). In this study, geographical distance limited access to people; however, it did not influence relationships negatively because project members who were involved in direct communications kept up their connection virtually.

At the individual level, academics and industry/NGO representatives mentioned a lack of time due to other commitments as a significant barrier to sharing knowledge. These findings confirm what is known from previous studies which have indicated that a lack of time, or at least adequate blocks of time, can be a major constraint to knowledge sharing within virtual teams (Francis-Smythe 2008).

8 Conclusion

The purpose of this paper was to identify knowledge sharing challenges in a University-NGO collaborative project. Nonaka's framework was adapted to describe the communication and interaction within the project to depict knowledge sharing challenges in ProjectNGO context. In answering the

research question, the findings of study by using Nonaka's theory of knowledge creation showed that project members encountered barriers to knowledge sharing such as organisational culture differences, language differences, telecommunication access, time, lack of written documents of the procedures, lack of knowledge capture and lack of organised research datasets. From the results of this in-depth case study in identifying knowledge sharing barriers, proposed guidelines including five steps have been developed.

As with any research based on case studies, particularly where the specific context is important, this study's findings may not be generalisable beyond the specific context. While this study has been conducted in the Australian context and based on project involving an IT faculty, we believe that these findings will assist in understanding of the barriers of knowledge sharing across other university–industry/NGO collaborative projects. There were shared practices in terms of communication alongside marked differences in workplace culture, ICT infrastructure and lack of KM tools. By identifying the barriers of knowledge sharing in collaborative projects, the research findings could help NGOs, industry or universities by providing them with guidelines through which they can discover new opportunities to facilitate knowledge sharing among the actors. That, in turn, could improve interorganisational collaboration.

The study has had limitations in terms of access to people, mainly related to scheduling time for interviews with industry and NGO representatives, who were all very busy. Recruitment was quite time-consuming and the appointments for interviews needed to be re-arranged several times.

There are several interesting avenues of future research that could follow on from this study. First, future research could be conducted to extend the investigation into other contexts. Second, the evidence from this study suggests that studies on the NGOs context in terms of their impact on knowledge sharing mechanisms could be useful. Lastly, there is a need to validate the proposed five steps through additional cases involving other universities and external parties engaged in collaborative projects, which would increase their usefulness in practice.

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