Exploring the factors that influence and the barriers that hamper knowledge sharing between academics – Using a SECI model approach

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Abstract

The emergence of a Technological University sector and a post-Covid model of learning, teaching, and assessment has resulted in Irish higher education undergoing a remarkable transformation in the pursuit of an augmented offering, fuelled by greater collaboration and knowledge sharing. Whilst there is a considerable evidence base for the motivations and barriers to knowledge sharing in Asia and less so in a European context, few studies explore these issues from a transformational perspective.

To contribute to our understanding of these issues, an exploratory study of knowledgesharing practices of seven faculty members using a knowledge audit gathered their insights on barriers and enablers. Guided by the Socialisation, Externalisation, Combination, Internalisation (SECI) model (Nonaka & Takeuchi, 1995), a thematic analysis of the outputs of the audit reveals a range of factors that affect participant practices. Trust was identified as the primary antecedent to knowledge sharing. Participants emphasised regular face-to-face contact as an essential enabling factor, which was reduced significantly during the Covid emergency measures. Participants identified information communications technology (ICT) as both an enabler and barrier, while the insufficient provision of physical resources was considered an obstacle.

Although this exploratory study was limited to a qualitative analysis of a small sample of academics, it nevertheless suggests that individual attitudes are major factors in the propensity to engage in knowledge-sharing. As the University's genesis offers a blueprint for transformation across the fledgling technological university sector, a potential role for staff mentoring in nurturing conducive attitudes was identified.

Keywords: Knowledge Sharing, Tacit, Explicit, Mentoring, Motivations, SECI.

Introduction

The research presented was to explore the motivations of academics for knowledge sharing and understand the barriers that hamper sharing. The key areas are (i) People: Motivational Factors to knowledge sharing (ii) Process: Knowledge sharing methods and processes (iii) Technology: Information Technology.

The aims of this study are to (i) explore the factors that act as the key enablers and barriers to knowledge sharing, (ii) gather suggestions for methods in which knowledge sharing can be enhanced. In exploring the literature, the areas of interest included an investigation into what knowledge is and how we classify it; understanding knowledge sharing approaches, and motivations for sharing.

What is Knowledge and how is it classified?

As one of the main influencers and theorists of knowledge, Nonaka identifies knowledge as a multidimensional concept (Nonaka, 1994). In addition, Davenport and Prusak (1998) acknowledge knowledge as something deeper and richer than data or information. Bartol and Srivastava (2002) saw knowledge as a broad concept that "includes information, ideas and expertise relevant for tasks performed by individuals, teams, work units and the organisation as a whole". As identified in the literature, there is a consensus among academics and the broader professional community that knowledge is an essential resource for an organisations' success.

The importance of the presence of concrete knowledge-sharing practices is to effectively manage the organisational knowledge bases between knowledge workers (Nonaka & Konno (1998), Bartol & Srivastava (2002)). The key enabling factor where knowledge sharing through informal interactions lies is in the trust between the individual and the organisation.

Despite the beliefs that exist amongst the various theorists on knowledge, researchers have yet to come to a complete agreement on the differences existing between knowledge and information. Nonaka (1994) considers that information is just "a flow of messages" while knowledge is based on information and on one's belief. Kogut and Zander (1992) suggest

that all information is considered knowledge, but that knowledge is more than just information, and includes information and expertise.

Polanyi states that knowledge has little value without personal involvement in understanding. In his many writings Polanyi (1969), emphasises the importance of tacit knowledge. Over the years, researchers have categorised organisational knowledge into various typologies. Nonaka and Takeuchi (1995) identify tacit and explicit knowledge and Prichard (2000) explored the characteristics to explain these two categories. Other researchers arrived at other outcomes, including Choo (1998) who sees three distinct types of knowledge (tacit, explicit, and cultural), and then Boisot (1998) describes four types namely personal, proprietary, public knowledge and common sense. There are three core types of knowledge namely explicit, implicit and tacit that work together to understand how we communicate information to each other.

Exploring the theory of knowledge, it is concerned with the question of what knowledge and how knowledge is managed, shared and acquired.

Knowledge management refers to 'the conscious process of defining, structuring, retaining, and sharing the knowledge and experience of employees within an organisation'. The primary goal of knowledge management is to allow the connections develop between staff who are seeking information, or knowledge from the organisation. It can be separated into three principal areas to include (i) accumulating knowledge (knowledge acquisition), (ii) storing knowledge, and (iii) sharing knowledge.

By accumulating and storing the staff's knowledge, organisations can keep their position in the relevant field (Rowley 2000, Fullwood et al, 2013). In addition, sharing this information throughout the organisation informs staff of what can aid and support performance or inform strategic initiatives. Organisations must support and promote a culture of learning and development, so employees are encouraged to share information.

Knowledge management for implicit and tacit knowledge can be hard to implement. Ensuring that proper procedures and a supported knowledge management system are in place, can ensure all relevant information is shared around the company and retained as staff retire or move into other positions or organisations. The main challenge widely identified of organisations sharing practices is to protect and maximise the value derived from the tacit knowledge held by their employees.

Organisational knowledge is the knowledge shared by individuals best identified by the four different modes of knowledge conversion described in the SECI model by Nonaka and Takeuchi (1995). The model stands for socialisation, externalisation, combination, and internalisation as in Figure 1.

г	Tacit knowledge 7	o Explicit knowledge
Facit inowledge	Socialization	Externalization
From Explicit	Internalization	Combination

Figure 1: Modes of Knowledge Creation (Nonaka & Takeuchi, 1995)

(i) The socialisation mode involves sharing skills and experiences through observations and imitations, thereby creating tacit knowledge from tacit knowledge. Tacit to tacit dialogue involves two people having a common interest and meeting and sharing ideas e.g., Watercooler conversation.

(ii) The externalisation mode converts tacit knowledge into explicit knowledge using metaphors, analogies, models, and concepts through books or manuals. Tacit to explicit dialogue was classified by Nonaka as "Externalisation" where a person's tacit knowledge is shown and codified into explicit knowledge. Tacit knowledge may be communicated using metaphors, thereby allowing the receiver of the knowledge to contextualise it relevant to their own context or experiences.

(iii) The combination mode transfers existing explicit concepts by analysing and reorganising information within the organisation from one area to another (e.g., aided by computer systems). Explicit to explicit dialogue within an organisational perspective, is seen as information processing. (iv) In the final aspect of the SECI model, internalisation identifies the transfer of explicit knowledge into tacit knowledge that refers to a hands-on approach using actual experience or simulation models. Nonaka indicates that this is the closest to what would be considered traditional learning and uses this to distinguish between an organisation that calls itself a learning organisation, and one that is concerned with knowledge creation. To maximise knowledge creation an organisation should employ all four modes of the SECI model.

Several authors support the view that individual creativity contributes to the growth of collective knowledge. Views exist that the effectiveness of knowledge-driven work is related to the creation of new knowledge and the sharing of useful existing knowledge through the interaction between tacit and explicit knowledge (Nonaka and Takeuchi, 1995; Spender; 1996; Sveiby, 1997).

Knowledge Sharing, Methods and Motivations

Knowledge sharing is the process of transferring tacit and explicit experience and information from one individual to other members within and beyond an organisation. Sharing knowledge can increase productivity and empower everyone to do their jobs effectively and efficiently.

The approach to knowledge sharing may be either through formal and/or informal methods through written correspondence, face-to-face communications or by using an electronic knowledge management system (Cummings, 2004). Knowledge sharing and the methods of sharing may differ according to who shares knowledge and with whom it is being shared with. Successful knowledge-sharing efforts require a focus on more than simply the transfer of the specific knowledge. To share knowledge various mechanisms including file and paper exchanges, presentations and mentoring are crucial. Overcoming the factors that can complicate the process of knowledge internalisation are of the utmost important to maximise the knowledge-sharing effort.

Knowledge generation is grounded in social practices, while knowledge sharing occurs through social interactions. Garcia et al (2003) recognised that the process of knowledge sharing, and knowledge generation occurs across different networks in the organisation.

Davenport and Prusak (1998) discuss that knowledge sharing between employees allows organisations to exploit and receive help from knowledge-based resources. A culture of openness must exist in an organisation for effective and efficient knowledge sharing to occur and networking, teamwork and collaboration needs to be encouraged and supported. Nonaka and Takeuchi (1995) keep that for organisations to remain productive and innovative they need to engage in a continuous knowledge creation journey.

There are several opinions about whether knowledge management in general but also knowledge sharing practices should be technology-driven or people-driven. Researchers in the field of knowledge management argue that knowledge sharing is mainly about people rather than about technology (Cross and Baird, 2000; Davenport, 1997). Brown and Diuguid (2000) found knowledge has both an active and a social dimension, where work within organisations depends on personal interactions with others.

Sveiby (2002) identifies organisations such as 3M, Boeing or, Hewlett Packard that have knowledge management strategies centred around the development of a culture of knowledge-sharing where information technology systems play a crucial support function.

In a recent paper, Castaneda and Toulson (2021) evaluated the effectiveness of ICT tools for sharing tacit knowledge in organizations. In the study, positive observations supported the utilisation of ICT tools in helping the sharing of tacit knowledge but only when they allowed true dialogue to occur. Earlier studies on the use of ICT showed there were differing opinions on the effectiveness or otherwise of ICT tools for sharing tacit knowledge. Information technology can turn data into information. Information is interpreted and turned into knowledge through people. (Bhatt, 2001).

Technology can and is a crucial conduit for knowledge sharing. Bhatt (2001) explored knowledge management in organizations by examining the interaction between technologies, techniques, and people. It was shown that the tripartite interactions are what allows an organisation to manage its knowledge effectively. By creating and nurturing a "learning-by-doing" environment, an organisation keeps its competitive advantages.

Motivations

To create this nurtured environment, people need to be and feel motivated. Several factors that can increase motivation in individuals within an organisation include a sense of achievement, recognition/acknowledgment, advancement through promotion, possibilities of personal growth and a sense of responsibility. In a discussion on knowledge sharing, it is essential to explore and understand the application of the many relevant theories including social cognitive theory, altruism, and social exchange theory that may aid and actuate knowledge sharing by individuals. (See appendix 1 for further details)

Organisational culture

Organisational culture can act as both an enabler and barrier to knowledge sharing and Lee et al (2016) discussed that it was one of the most significant barriers to effective knowledge management. Organisational culture plays a key role in the willingness of individuals to share knowledge. Knowledge based organisations may require meaningful change in culture and values, organisational structures, and reward systems for effective knowledge management. Ensuring that the organisation supports staff throughout their career is vital.

The accessibility of knowledge is still limited because most knowledge lives in people's heads or in documents that aren't readily accessible to others. That's a main reason the increasing number of organisations recognise how important their employee's tacit knowledge is. Sharing "tacit knowledge among multiple individuals with diverse backgrounds, perspectives, and motivations becomes a critical step for organisational knowledge creation to take place" (Nonaka and Takeuchi, 1995, p. 85)

To allow real opportunities for active learning through the transfer of tacit knowledge, new academics should be formally mentored by more senior staff. Bean et al (2014), showed how universities can receive help from mentoring, and what mentoring programs are most effective. Evidence exists to support the idea that new faculty who have been assigned a mentor perform better as scholars and experience higher confidence (Allen & Eby, 2007; Eddy & Gaston-Gayles, 2008). Formalised academic mentoring relationships typically involve an experienced academic supporting a new academic (Mullen & Hutinger, 2008),

however, the case has been made that faculty would receive help from mentoring from initial hire through to retirement (Peluchette & Jeanquart, 2000). Leonard, Barton, and Barton (2013) explore a mentoring approach based on observation, practice, partnering, and joint problem solving, and taking responsibility. It is a strategy for employed allowing tacit knowledge sharing through guided experiences.

In the context of this research, it is interesting to look at other studies that have been carried out in other HEI's regarding knowledge sharing. Much is limited in a higher education context due to cultural differences as it has primarily focused on Malaysia and Saudi Arabia. Alsuraihi et al (2016) investigated the knowledge-sharing practices among Saudi academics and revealed that knowledge sharing is fundamental to the achievement of knowledge management practices in all universities. The academics had a positive attitude and felt very strongly about the importance of knowledge-sharing practices among academics.

Tan (2016) concentrated on the impact of knowledge management factors in encouraging knowledge sharing among academics using a questionnaire in the study. The findings revealed that the influencers towards knowledge sharing include trust, organisational rewards and culture, and face-to-face communication.

Chong et al (2014), investigated the knowledge-sharing barriers and strategies of academic staff and indicate that it involves a people-technology process. Fullwood et al (2019) explored factors that influence knowledge sharing between academics and found that there exists a culture of trust and willingness to share knowledge with their colleagues. The study showed that the matrix structure, typical of academic departments, has led to unclear roles and responsibilities, which could hinder the design of structures to promote collaboration and sharing.

The research pursued in this study uses a knowledge audit to garner academics views on knowledge sharing within the organisation and to understand the enablers and barriers that may affect knowledge sharing effectiveness.

Methodology

This section offers a rationale for the methodological approach that was adopted for this study. It identifies the research design that was employed, the ethical considerations that were advocated to justify the knowledge collection and the evaluation strategies that have been adopted. It endeavours to accumulate and investigate academics views on the motivations, barriers and challenges of knowledge sharing.

The research method employed is associated with aspects that cannot be quantified and considers verbal explanations as opposed to statistical analysis in studies of a small number of cases (Hammersley, 2013). Patton (2005) defines qualitative research as the analysis of data from direct observation of real-life scenarios collected by way of an in-depth knowledge audit including open-ended questions. One of the merits of the knowledge audit approach using semi-structured interviews in the study is that the researcher can 'draw out from the person interviewed the deeper significance of the event'. The qualitative interpretive paradigm was considered most suitable to adopt for this study as it allowed academics to share individual feelings and experiences on the research area.

The principal inclusion criteria were that the participants must be a current full time academic in the University. The research was conducted by using in-depth interviews with seven selected participants from a third-level educational institution to comprehensively describe and build an in-depth understanding of academicians' knowledge-sharing motivations. It is quite common that the size of the sample in qualitative research is small (Fossey, Harvey, McDermott & Davidson, 2002; Ryan, Coughlan & Cronin, 2007). Academics from a variety of schools, from different disciplines and different lecturing grades, were selected to ensure a diverse range of opinions were taken into consideration. Even though they work in various schools, the conclusion is that they are a homogeneous group since all of them were academics within the same University.

The interviews involved the use of a knowledge audit devised on Microsoft forms and the use of probing questions when considered right by the researcher. The questions were used to ascertain the lecturer's experience, opinions, and motivations for knowledge sharing.

Confidentiality and anonymity of all participants involved were guaranteed throughout the entire process and pseudonyms were utilised to safeguard this position. Ethics approval was sought and granted by the ethics board in the school prior to the study beginning. All ethical considerations were followed throughout the study.

The initial knowledge was collected from participants over a three-month period. The audit continued with the individual participants until they did not introduce any new or different information and the data saturation had developed in the answers. Reaching the saturation stage decides the theoretical point at which sufficient data has been gathered. (Baker and Edwards 2012). On a review of the initial data collected based on the 6 knowledge audits, it was seen that there was a definite gap in the profile of the participants – as all had greater than 15 years of experience in the organisation it was felt that it would be important to interview a member of staff with less experience in the organisation and more junior in their career. Hence, a two-phase approach was carried out in this research.

All participants were either interviewed online using TEAMS or face to face. Two participants requested to be part of a two-person interview rather than being interviewed one-on-one. It was found however that a one-on-one interview was better as it allows individuals to supply their own perspectives without having a colleague influence it. Each audit study was recorded and transcribed using Otter.ai and the recording was later reviewed to ensure the accuracy of the transcription. The transcripts were reviewed, and summary notes were made. Hammersley and Atkinson (1983) recommend that one immerses oneself in the data to seek out patterns in the data.

The second step taken after gathering the data was an open coding and analysis of the participant's responses to the research questions. In the coding process, the transcriptions were reviewed and analysed several times, coding of responses were line-by-line, and the key concepts were identified through free coding initially using Microsoft word then using NVivo software. Recurring themes were extracted and isolated initially using open coding then selective coding was implemented to refine the results. I found that some of the themes flowed from topics that I had previously uncovered in the literature (Dey 1993).

Research Results and Findings

This section presents the results and findings from the knowledge audit study pursued using semi-structured interviews. The principal themes are centred around People, Processes, and Technology. In the discussion of the findings the knowledge garnered during the knowledge audit will be aligned to aspects of the Nonaka and Takeuchi SECI spiral of knowledge model. (Nonaka and Takeuchi 1995). As previously outlined in this paper, there are four modes of knowledge conversion in the SECI model that are created when tacit and explicit knowledge interact with each other. The findings will highlight the views of informal/formal knowledge processes. The paper offers a perspective on how the ongoing knowledge processes in the University can be enhanced to support and develop the University's learning capability.

The main findings from the research are outlined and discussed in more detail including the culture of the organisation, the organisational structure, information technology, and other factors which pertain to the motivations of the individuals. Table 1 outlines the participants' profiles including their demographic characteristics gathered using the knowledge audit.

Participants Code	Position / Grade	Discipline	Years of services at University	Gender	Years of Experience PG	Highest Education Level
R1	L	Computing	>20 years	Male	25-30	MSc
R2	SL1	Engineering	>20 years	Female	25-30	MSc
R3	L	Engineering	>20 years	Male	25-30	MSc
R4	L	Science	>20 years	Female	25-30	PhD
R5	L	Business	15-20 years	Female	25-30	MSc
R6	L	Business	>20 years	Female	25-30	MSc
R7	AL	Science	<10 years	Female	10-15	MSc

Table 1. Demographics of Participants

AL: Assistant Lecturer, L: Lecturer, SL1: Senior Lecturer 1

The audit was divided into sections including personal knowledge profile, demographic information, work analysis, knowledge and information sources, organisational culture, motivation, and knowledge management in the University. Using the knowledge audit, participants were asked to respond to their beliefs about knowledge sharing using established questions. The participant's responses are used to outline their motivations to knowledge sharing and the barriers that they see to limit knowledge sharing in the University.

The research found that the main factors influencing knowledge sharing were trust, mutual respect, a feeling of responsibility, a sense of belonging, mentoring and culture.

Research Results

The first observation of the research pursued was that knowledge sharing, was accepted as a normal activity by the participants. Descriptions of knowledge sharing were that it was a desired, expected and assumed requirement of their roles as academics. Participants spoke about their willingness to share and how they gained significant pleasure from sharing knowledge. This aligns well with the contextual factors in prior literature on fairness and affiliation.

Participant 2	"I see the value in the knowledge and experience I have gathered during my		
	career and feel it is important that I share"		
Participant 3	"Feel good factor, helping someone, good karma"		
Participant 4	"I think you're always learning so you can't learn if you're not sharing"		

Most academics share knowledge freely if they believe there is a relationship existing amongst each other based on trust and mutual respect. To successfully carry out their roles, participants referred to the importance and value of sharing their knowledge and to be collaborative with colleagues in their own functional areas and across other areas. However, during the knowledge audit, there were specific references to siloing and knowledge hoarding existing in relation to sharing to avoid supplying a competitive advantage on for example applying for research grants.

Participant 3	"I see that there is a competitive element that exists where funding is		
	concerned which encourages the silo mentality and supports 'knowledge		
	hoarding.' I see the academic that does not share is a researcher. It is my		
	experience with some colleagues do not share knowledge because it may		
	give someone else an advantage."		
Participant 4	"It comes down to personalities, there are some colleagues who would be		
	completely willing to share everything - there are colleagues within our		
	department who have a fear of sharing knowledge for whatever reason,		
	is it because they feel they spent all this time gathering that information and		
	putting it together?		
	"When I've been asked to deliver a new course, I spoke to the person who		
	previously taught it and they certainly didn't want to share their lecture		
	notes, and they wouldn't even show me the content, let alone share."		
Participant 5	"Sometimes staff can be a little bit custodial"		
Participant 6	"You could have worked very well with an associate lecturer. And then		
	you might find your module is gone to them next year. Just as a result, you		
	know, you became a little bit closed, 'once bitten, twice shy.' Sharing is		
	generally an advantage with all my full-time colleagues."		

A couple of participants cited that in their own groups the willingness to share lecture notes and other supports was vastly different to other third level institutions that they had previously worked in and there was much more readiness to share and help.

A couple of participants mentioned that sharing knowledge with colleagues from other departments at times was easier as they felt more secure in this situation and avoided any risk of being ridiculed or undermined. They did not want to appear incompetent in front of their peers. This was certainly clear in the early days of Covid when all teaching was moved online, and individuals needed extra support to pivot online.

Participant 6 eluded several times during the interview that they thought that interdepartmental subcultures were quite different and associated this with the attributes of people teaching in a particular discipline that was more research focused.

Participant 5	"I learned more walking down the corridor, than I ever have at any meeting,		
	and I make a point of talking all the time to engineers, scientists within our		
	campus, as many of them as I can, as well as in my own department with my		
	own colleagues. So that sort of cross fertilisation of ideas and information		
	is really, useful. You know, we can learn how other departments are doing		
	things differently to us."		
Participant 4	"Personal connections are effective in one-on-one situations, they create		
	more barriers to knowledge sharing within the organisation, as the		
	information shared is often contained within a defined and narrow set of		
	people. It requires staff to know which colleagues to contact."		

Participant 5 remarked on how important it will be that where ongoing remote/hybrid working exists that this does not result in knowledge silos developing within the organisation. This was aligned with views that supports for new and existing staff need to be put in place. The suggestion of mentoring was made based on their individual experiences with understanding the support required for associate staff to ensure they understand the role of an academic and the processes and protocols that need to be adhered to. The suggestion of mentoring was also reinforced by another participant noting the possible value of an apprenticeship approach for new staff. Participants spoke about the importance of succession planning being incorporated into the strategy for staff hiring.

Participant 4	"You could have a buddy system to help transfer the experience from one person to another".
Participant 5	"We really need to clean up how we manage both new entrants, and even more importantly, associates to safeguard the quality of delivery, the quality of content that needs to be taught more support for those staff members. a sort of mini internship that you would have within other roles".
Participant 7	"When I started, I really did not even know where the policy documents were or that there were policy documents. To guide somebody that is new into that kind of thing. asking another lecturer was great at getting the information and I found people were particularly good at sharing".

All who took part in the knowledge audit spoke about the frequency of sharing at various levels and the nature of the sharing methods. The academics use emails, meetings – both virtually and face to face and workshops to share knowledge amongst one another. There was a significant emphasis and support from all the participants involved in this research for face-to-face meetings. Participants in general found great benefit in conversing with colleagues from other departments during a daily coffee break. This continued in a virtual capacity during the COVID 19 pandemic and found to have other benefits. There is a clear deficit in the physical structure of offices and spaces to engage in knowledge sharing. During Covid– the online environment supported individuals meeting and sharing but it also created an environment of unease where some people did not use their cameras, and this created a sense of mistrust.

Participant 4	"I'm not a very technologically minded individual. Nothing beats sitting in
	a room face to face with somebody".
Participant 5	"On our campus, we do not have any small meeting roomsso, to get
	somewhere to meet somebody, formally or informally is next to impossible
	you know,having a conversation with an industrial colleague that is
	not conducive to good knowledge sharing".
Participant 7	"I found some colleagues left off their cameras while in online one on one
	meetings and I felt this was disrespectful".

A considerable number of respondents cited the importance of the staff common room to the sharing culture. Almost all of the participants in this study have office space in open plan offices sitting beside others from different disciplines. Interestingly Participant 7 spoke about her desire to sit nearer her colleagues from her discipline area to support her in her work. She felt isolated at times because of the nature of the programs she was involved in. The challenge of who to contact in relation to specific questions and issues was raised several times. A suggestion she made was to create a directory and keep it up to date making explicit the information on roles/responsibilities to facilitate the access to the right person or department.

All participants spoke about how important the information and knowledge held by their colleagues is to do their jobs well, and they prefer personal, human-centered connections to address their information needs. They also rated personal connections and interactions as most effective in helping them resolve problems quickly. However, again it is commented on that hybrid work has made it harder for this knowledge transfer. Personal connections are effective in one-on-one situations, but they can also create more barriers to knowledge sharing within the organization, as the information shared is often contained within a defined and narrow set of people. During the last couple of years as we all experienced a momentous change in the physical work environment, several participants referred to the isolation they felt from the rest of their co-workers, making it more difficult for them to meet and build connections with their colleagues. Although many saw that the technology was available, they found it harder to reach out to others when they needed help. Further barriers highlighted were lack of time and working from home.

D. ("We are all time poor. We start each semester with our head down. We need
Participant I	to be reminded to look up and have those conversations and take a breath
	to try and focus on what we are trying to achieve through all of this with
	our students and with each other "

During the last couple of years as we all experienced a change in the physical work environment because of the imposed remote working situation, several participants in the knowledge audit referred to the isolation they felt from the rest of their co-workers, making it more difficult for them to meet and build connections with their colleagues. Specific references were made by the participants to pre-pandemic times and the changes that occurred over the two years including the impact of the organisational design.

10			
Participant 1	"Great sense of collegiality amongst colleagues during COVID times-		
	however, missed the sense of community.		
Participant 4	" I think with the newer members of staff, it has not been helping with both		
	COVID times and the reorganisation within the University. So, you have not		
	had the same opportunities to interact with them. So, I am culpable for not		
	making a better effort to get to know and develop a good working		
	relationship with the newer members of staff."		

Utilising the knowledge audit, the participants outlined their experiences of sharing their disciplinary and professional expertise; organisational knowledge, such as policies, and procedures; using material objects such as documents and technologies as well as the social dimensions of knowledge sharing. A significant example pointed out by participant 1 was the lack of processes and consistency existing around the execution of exam boards and the decision-making that happens there. The extent of associated explicit documents is not sufficient to reflect the extent of knowledge existing in the departments and schools around the process of exam boards. The comment was also reinforcing the need for supports for new staff to ensure that they understand the essential processes.

Most but not all the participants agreed that sharing of both their disciplinary and organisational knowledge in the form of subject-related knowledge arising from their earlier education / ongoing training, professional career experiences and their extensive social

network was extremely important and very much valued by their colleagues inside and outside of the University. It was clear based on the knowledge audit that a couple of participants wondered did their colleagues know the nature of their knowledge, experiences, and educational background.

Participant 5	" there are so many individual skills, not pulled out and properly		
	identified within the department, we are not maximising those at all"		
Participant 6	"Some people can be funny, like you are a sharer and I would say I am a		
	sharer. Not everybody is comfortable with sharing"		

In several cases, there was a sense of protection over important external contacts details. It is clear based on the audit that a more transparent reward system needs to be applied to encourage knowledge sharing. Many participants identified that the nature of recognition provided to them was limited and very much localised within their functional areas by their colleagues and in some cases their managers.

The knowledge audit and questioning showed that although support through technology was available, some participants were challenged to reach out to others when they needed help. In discussing their technical competencies, many spoke about the fact that they were digital visitors and as such understood the importance of technology but not completely comfortable with it. (White & le Cornu, (2011))

Based on the participant's responses that despite their skills, all commented on the University website and its ineffectiveness for knowledge sharing. Information is scattered across many sources and often the information is outdated and irrelevant. They struggled to find the relevant information even using the search function. Interestingly the only participant who was not aware of where policy documents lived was the most junior in the study and she felt that it would have been useful to have had a more formal induction program when she started in the organisation.

Participant 4	" Pre designation you could go to our website; you could go to either the
1 articipant 4	staff intranet page or the internet. There was a huge amount of
	documentation, and you knew that is where you would find it. I am not
	entirely sure now with the new website where you would find a lot of
	documentation that we need."
	"My opinion would be that to encourage knowledge sharing that a good
Participant 2	coffee machine, nice seats and décor might achieve more than some "Killer
	App. "
Dentisiana 5	"New staff could be six to eight weeks before they get a work email address,
Participant 5	their ability to access Moodle, simple functional things are not happening
	properly and timely. Students are seeing that and they are looking at us
	disjointed. That is a major area for serious immediate improvement."
D. ('.'. 47	"I had received an email on how to print but it gives you a URL to attach
Participant /	to connect, but if you are on campus and you cannot connect to the internet,
	it is not great to have to try and find an email with an embedded URL in it.
	It would be better if they had notices up beside the printer to tell you how to
	access it or someone available to help you if on campus or someone more
	readily accessible on TEAMs. The helpline is fine but leaving a message
	and waiting for someone to reply often doesn't solve the problem quick
	enough."

There are many mentions of how IT has enabled accessibility of and engagement with CPD over the last couple of years. This has been a positive output of the pandemic. However, many commented on the need for training/education provision for staff to be more flexible from a delivery perspective – allowing better access to the courses to facilitate different needs, timetables, etc. The Virtual Learning Environment, files/chats on TEAMs, and one-drive were all mentioned as potential knowledge repositories and as a mechanism to share knowledge. However, there is no consistency in the approach in the University to their use as knowledge repositories. Post-Covid, the lack of real-time IT support on the ground resolving technical issues hindered work practices.

Leadership was not really commented upon or classified during the interviews. One participant referred to their line manager frequently and commented on the supports they provided to them. Others commented on their line manager supporting them in their work and enabling them to share. In the main, there were very few explicit directions however by managers to promote Knowledge Sharing activities apart from during departmental meetings.

Summary of research findings and recommendations

- 1. Overall there is a sense of a lack of trust in the People, Processes and Technology within the organisation.
- 2. Emphasis on establishing a suitable knowledge management system.
- 3. Lack of supports for new and existing staff Suggestion for a mentoring programme for staff.
- 4. Lack of real time IT supports on campus or online is proving to be challenging.
- 5. Lack of adequate meeting spaces available for staff to sit and have discussions and meetings both formal and informal.

Discussion

The goal of this research is to look at various aspects of knowledge sharing as it exists within a specific educational organisation. Exploring how knowledge is shared in terms of people, processes and technology.

Data analysis methods using coding were used to support the research ensured the thematic categories were right. Many research articles were considered with the aim of understanding the outcome of the qualitative findings. The purpose of the study was to explore and describe the knowledge sharing motivations of academics in a single University setting. The results of the knowledge audit revealed some key factors that would motivate individuals to share knowledge and indeed also the barriers that are in place. Crucially in evaluating the findings it was interesting to look at how findings of the study aligned to the elements of the SECI model.

As specified at the outset of the paper the key themes fell under (i) People (ii)Technology (iii) Process. The results show some interesting factors that motivate and likewise hinder individuals in academia to share knowledge within the institution.

Evidence presented during the audit suggests a significant lack of trust exists associated where all the three themes are concerned. This is proving to hamper the knowledge sharing that is happening in the university. Francis Bacon saw back in 1597 that 'knowledge is power'. It is quite common within academic environments for knowledge silos to prevail. (Ondari-Okemwa (2007), Gaffoor (2008)). There can result in a resistance to the dissemination of knowledge. Many who have knowledge, resist sharing it, but is also important to note that sharing knowledge requires time and effort.

The SECI model as previously described is quite prescriptive in its presentation of the types of processes needed for the successful implementation of organisational learning (Nonaka and Takeuchi 1995). The presence or absence of any of these processes may be separately viewed as potential precursors or barriers to the successful creation of knowledge within an organisation.

It is clear in talking to the participants in this study that knowledge sharing is deeply embedded in their practice within their functional areas and beyond. This kind of knowledge sharing corresponds to the process of socialisation in the SECI model. Although there are many emerging technologies that facilitate efficient remote communication the results of this study agree with the SECI model that argues for the importance of face-to-face meetings to set up the basic sharing of tacit knowledge, which is the primary building block of the SECI process.

The positive support for face-to-face meetings and better meeting spaces is supported by research by McQueen et al (2016) where they explored the relationship between face-toface social networks and knowledge sharing. That study revealed that face-to-face social networks facilitate knowledge sharing using multiple communication styles, brainstorming and problem-solving to name a few. The emphatic support for knowledge sharing through face-to-face communications by the participants is also supported by studies by Davenport and Prusak (1998,99). Their assertion is that 'sometimes knowledge transfer can only work if the various parties are brought together physically'. There was widespread agreement by the participants in the audit that the physical structure of office accommodation held extreme significance in terms of this face-to-face knowledge sharing. Cross and Cummings (2004) support this affirmation as they explored the importance of the physical structure and location for employees. The closeness of office spaces enables ease of flow of relevant information and that partitions or walls could potentially restrict information flows. A further development by Nonaka, in co-operation with Konno was to add to the SECI model the Japanese concept of 'Ba', or 'place'. Ba refers to any shared space be it real or virtual where knowledge can be shared. (Nonaka and Konno, 1998).

Following the pandemic and changes in work practice to a more hybrid approach, many faculty members chose to work from a location other than their college offices and the relationships that form from regular personal interactions were challenged to thrive. Many faculty members continue to be off-campus regularly and opportunities for chance meetings are considerably reduced. Szulanski (1996) identified the lack of intra-organisational relationships often leads to the failure of the communication process. Social networks that support formal and informal approaches to knowledge sharing to occur, often do not thrive

within an organisation because of a change in work-practice. This is certainly a sentiment that has been expressed in this study.

However, what is quite clear is that knowledge sharing between the communities where socially embedded tacit knowledge is converted into explicit knowledge is inadequate. Academic staff can have meaningful dialogue which can reveal hidden tacit knowledge when supports are put in place for this externalisation (tacit-explicit) of knowledge (Nonaka (1994)). Considering the profiles of the participants in this study there is significant expertise, views and beliefs to be captured through documenting staff points of view on project and strategies.

IT cannot capture and distribute tacit knowledge, so the organisation needs to value their employees' tacit knowledge to avoid having an excess of data and a poverty of knowledge (Currie and Kerrin, 2004). It is well known that IT can facilitate effective information sharing and encourage networking to support formal knowledge sharing. IT systems have the capabilities to act as directories of knowledge experts: those people who hold the tacit knowledge and can pass on expertise (Haynes, 2005). There were suggestions of supporting an up-to-date staff directory with defined roles and responsibilities and exploring other possible sharing opportunities. Examples of using wikis and blogs to support knowledge creation and elicitation through the externalisation element of the SECI model within the organisation.

The combination mode transfers existing explicit concepts by analysing and re-organising information within the organisation from one area to another. The combination process reformulates explicit knowledge into a clearer and more beneficial form for its staff. This has proved to be inadequate where the use of the intranet and internet is concerned and keeping the documents up to date and easy to access. The organisation has come to rely on the intranet / internet to keep staff informed concerning available knowledge resources. However, as was remarked upon by many participants, it is often challenging to navigate and find the information needed.

Knowledge transfer and elicitation within academia is often stilted because there is no clear direction on where or from whom to seek certain types of knowledge. Nonaka, Toyama and

Konno (2000) are of the view that training programs can help in reducing internalisation of knowledge. The audit revealed that regular, relevant and accessible knowledge sharing sessions are of the utmost importance for this to happen. While efforts have been made to help keep faculty members informed and engaged in the knowledge-sharing process, such efforts can often fall short. For example, over the last year a series of research seminars on teaching and learning were scheduled supplying an effective forum for sharing ideas. However, the seminars were at a specific time, and not always, supported within specific functional areas and so many were not well attended. The time element identified by participants certainly inhibits the accessibility for many pursuing qualifications aligning to the internalisation (explicit-tacit) element of the SECI model where sorted and joint knowledge can be converted into tacit knowledge.

Carmel et al (2015), investigated the processes and outcomes of an academic mentoring relationship on the professional development of a faculty member and the findings showed that the mentee was positively affected by opportunities related to career advancement, scholarly confidence and the facilitation of a collaborative culture. Based on these positive impacts, it is well supported that mentoring is an important activity and should be facilitated in higher education. The support for the transfer and internalisation of knowledge to new and existing staff by more experienced staff was a significant finding within this study.

Continuing the theme of mentoring for staff, it would be interesting to look at integrating the position of an Emeritus Professorship into the organisational structure. This would be an honorary position to a retired staff member who would undertake a variety of activities supporting other staff in academic activities. Baldwin & Zeig (2012) explored the significant efforts across the United States to make the status of the Emeritus Professor role more meaningful. It was felt that making the Emeritus status matter could make retirement more significant and more attractive and facilitating a continuing flow of talent through universities. The future vitality of the academic profession and the higher education environment depends in part on how well we treat faculty members who have served institutions for many years and still have much to contribute.

The table below brings the SECI elements together as a reference to facilitate knowledge exchange across the organisations.

SECI Element	Key Elements
Socialisation	Focus on potential barriers to personal knowledge exchanges
Externalisation	Develop system to gather tacit knowledge
Combination	Develop process to keep processes, policy documents up to date
Internalisation	Supporting mentoring programmes

It is important to note that the SECI model through the spiral of knowledge, that it goes from S -> E -> C -> I -> S -> E -> C -> I ->. This is sometimes a turbulent and violent process dependent on the factors that influence the elements of the process. For example, where the element associated with internalisation mode is concerned, 'supporting mentoring programmes' it may help to identify potential barriers, and so the spiral of processes continues. The SECI model is not only a model of organisational knowledge creation, but it is also accepted as a highly integrative knowledge management approach bringing together a wide range of knowledge processes.

Rice and Rice (2005) carried out a review on the applicability of the SECI model to multiorganisational endeavours and emphasised the need for an organisation to have the capability of exchanging knowledge to enhance the value of its own internal knowledge stock. Thinking creatively as to how the implementation of SECI principles and applying the key elements of the SECI model across organisational boundaries will create benefits for multi-organisational endeavours.

Fell (2021) explored the relationship of trust and COVID-19 and found questions of trust were raised in many domains, including interpersonal relationships, social behaviours, technology, and interactions with institutions and information. This prompts the need to

consider trust holistically when trying to understand it within any of these individual domains.

Individuals foster trust in relationships when they are certain that their dealings with the person will not cost them. Molm (2003) stresses that where trust exists between two people, they are more inclined to cooperate between each other. Nonaka and Takeuchi (1995) identify that interpersonal trust contributes to improvement in knowledge sharing behaviour amongst individuals. In a separate study, Wu et al (2009) found that interpersonal trust is related to knowledge sharing. Understanding and exploring the culture of an organisation is crucial to understand the trust element.

Factors such as the organisational culture, shared beliefs, values and behaviours help in knowledge sharing. If a university has a strong culture, the organisation can align its ideals towards achieving its mission and vision. However, in the organisational design the challenge exists to align and accept pre-existing cultures. The overall findings of this study suggested that the culture was seen to be influenced by the characteristics of the individual and in some cases the specific department, to a certain extent the degree of uniqueness of the discipline but also the physical structure of the accommodation. The reveal of the participants is that subcultures exist based on specific disciplines and as a result different approaches to sharing exist. Despite this, the general feeling was that culture in the individuals' participants' departments was accessible and very much conducive to sharing. The overall university culture was not mentioned explicitly, and this is ultimately supported by Cronin's (2001) claim that there is no universal culture in universities.

During social times, sharing and exchanging views with fellow colleagues takes place and this enhances motivation and team commitment which encourages knowledge sharing. Personal factors also affect knowledge sharing; factors such as individual attitude and aspirations. The technological factors in the world are continuously changing with advancements in technology and so technology is seen to impose a considerable effect on the success of any organisation than it did years ago. Internet connectivity and up to date technology resources are some of the technological factors that would enhance knowledge sharing in universities. It is important to note that the findings must be interpreted considering the study's limitations. As the data was collected from a small population in the organisation, the value in extending the research is recognised to explore further (i) individuals' knowledge sharing behaviours (ii) examining the sharing of specific types of knowledge assets and (iii) examine knowledge sharing beyond the boundaries of academics to understand how the organisation works.

Based on the findings, the following suggestions are proposed to those leading knowledge management initiatives or strategy development within the University to encourage knowledge sharing within the organisation.

- (i) To understand the supports and resources needed to nurture the social relationships and interpersonal interactions of employees.
- (ii) To actively support the formation of communities of practice to support knowledge sharing.
- (iii) To support the design, development and implementation of a mentoring programme for new staff to embed into the University.

Conclusion

The aim of this study was to look at the factors that support knowledge sharing and the barriers that hamper it.

Addressing the importance of the management process for knowledge creation it is essential to understand that the three models of management process need to be fully supported and encouraged for the overall success of the organisation. As a result of this knowledge audit, to support knowledge creation, knowledge sharing and elicitation that a top down, middle up/down and bottom-up management approach will need to be fostered.

At an organisational level to avoid siloing, it will be crucial to develop and implement a knowledge management policy and knowledge management system to address the challenges identified in this study and associated with knowledge sharing. To encourage a culture of sharing a middle-up-down approach promotes and supports the internal advertising of activity and research within the organisation. This interdepartmental cross

pollination will encourage knowledge sharing behaviour. To best communicate the continuous iterative process by which knowledge is created the middle-up-down approach works best. However, to nurture and support knowledge sharing at the grass roots, a bottom-up approach is essential e.g., use of wikis, blogs etc.

The SECI model, proposed by Nonaka and Takeuchi (1995) best proves the nature of knowledge management and of knowledge conversion and suggests that organisational knowledge can be created by amplifying the individual knowledge to be a part of the knowledge network of the organisation. This happens by converting the tacit knowledge into explicit and moving knowledge from the individual to the group, at organisational and inter-organisational levels (Nonaka and Takeuchi, 1995). This is an integrative approach that brings together a wide range of knowledge processes, by considering people, processes and technology to convert knowledge across these four levels.

The key outputs of this study fall into four principal areas. Firstly, it has added to existing research on tacit knowledge sharing. Secondly, it has used a knowledge audit to understand the motivations of academics to transfer of tacit knowledge. Thirdly, the findings can be used to make advances, to enhance a culture within the organisation that promotes openness and enhances the sharing of tacit knowledge. Finally, this paper has made a significant contribution to knowledge management by addressing an important question that has principally been ignored to date in the organisation under review.

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Appendix 1

Social cognitive theory argues that individuals consider a combination of factors including personal, social and environmental to make decisions on either to show a particular behaviour or not. In the context of knowledge sharing this theory can certainly explain that if individuals are not sure of their capabilities and the outcome of the knowledge they are to share, they may not share it.

Altruism has a linkage with SCT in that individual weigh up the psychological benefits before getting involved in sharing their knowledge. Although an altruistic person may be seen as a person who donates without looking for anything in return, Honeycutt (1981) argues that an altruistic person can indeed gain a degree of control over the recipient. Many individuals share their experience and knowledge with others without thinking of the benefit one may gain from it. Altruistic behaviour of giving something without expecting any return is personal (Chattopadhyay, 1999).

Comparing the two theories altruistic individuals act upon their personal goals to undertake knowledge sharing whilst social cognitive theory argues that it is the individual's ability to show certain behaviours are based on personal, social and environmental factors.

Social exchange theory is a model used in explaining knowledge sharing behaviour (Blau, 1964). This theory is concerned with people's behaviour, benefits, the environment and the networks that exist between individuals (Blau, 1964). This theory identifies the fact that individuals intend to share when positive effects are expected.