AN ACTION RESEARCH PROJECT TO DESIGN, IMPLEMENT AND MANAGE AN ENTERPRISE SOCIAL NETWORK FOR KNOWLEDGE SHARING IN VIRTUAL COMMUNITIES OF PRACTICE IN HIGHER EDUCATION

By

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Ethical Declaration

I declare that this thesis is wholly my own work except where I have made explicit reference to the work of others. I have read the DBA guidelines and relevant institutional regulations and hereby declare that this thesis is in line with these requirements. I have discussed, agreed and complied with whatever confidentiality or anonymity terms of reference were deemed appropriate by those participating in the research and dealt appropriately with any other ethical matters.

I have uploaded the entire thesis to Turnitin on Moodle, examined my 'Similarity Index', and have addressed any matches that exceed 3%. I have made every effort to minimise my overall 'Similarity Index' score and the numbers of matches occurring.

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Niall Corcoran   Date

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Abstract

Higher education institutions (HEIs) are knowledge intensive environments by nature. However, the management of organisational knowledge and the promotion of staff knowledge sharing is largely neglected in these institutions. This study examines how enterprise social networks can enable staff knowledge sharing in communities of practice in that context. The study is framed as an Action Research project, covering three cycles over a 12 month period from September 2015 to August 2016. During the Diagnosing phase, a conceptual model was developed for empirical testing. Data was collected through three focus groups and 30 semi-structured interviews, and this was supplemented by content analysis and reflective journaling. The findings support the conceptual model and provide insight into the antecedents necessary for the creation of an enterprise social network enabled knowledge sharing environment, the motivators for and barriers to participation, and the perceived organisational and individual benefits of increased staff knowledge sharing activity. The findings indicate that the barriers to participation are influenced by the prevalent organisation structure and culture, and a divide between faculty and other staff. However, individual benefits that accrue from participation may influence greater participation, and organisational benefits that accrue may influence organisational strategies that drive change in structure and culture to promote the development of the knowledge sharing environment. A number of findings have practical implications for the management of higher education institutions, such as the evidence of a divide between faculty and other staff, and the perceived existence of an organisational culture that inhibits staff communication, interaction and collaboration. In general, the study findings provide an opportunity for educationalists to better understand the scope and impact of employing social media platforms for knowledge sharing. This study adds to the growing body of work on organisational implementations of social media, and should be of interest to practitioners and researchers undertaking similar projects.

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List of Abbreviations

AR	Action Research
AUP	Acceptable Use Policy
CoP	Community of Practice
	Communities of Practice
DBA	Doctorate of Business Administration
ESN	Enterprise Social Network(s)
	Enterprise Social Networking
HEI	Higher Education Institution
ICT	Information and Communications Technology
IT	Information Technology
IoT	Institute of Technology
KM	Knowledge Management
LIT	Limerick Institute of Technology
OKM	Organisational Knowledge Management
PKM	Personal Knowledge Management
RQ	Research Question
SECI	Socialisation, Externalisation, Combination, Internalisation (Model)
SOG	Stages of Growth (Model)
WIT	Waterford Institute of Technology
vCoP	Virtual Community of Practice
	Virtual Communities of Practice

Section 1

INTRODUCTION & DBA RESEARCH OVERVIEW

1.0 Overview

This thesis is a report of an action research study undertaken within a public higher education institution (HEI) in Ireland over the period 2015 to 2016, and is rooted in the complex and rapidly changing convergence of higher education, information systems, and knowledge management. The organisation in question is known as an institute of technology (IoT) and, according to THEA (2017), "Ireland's Institutes of Technology are flexible and dynamic university-level Institutes focused on teaching/learning, purpose-driven research, and public service". The higher education sector in Ireland is made up of seven universities and 13 IoTs, under the auspices of the Higher Education Authority[1] (HEA). The study explores how social media tools are used in the organisation to enable staff knowledge sharing activities. This project involves the sourcing and implementation of an enterprise social networking (ESN) tool which is used to underpin the development of a knowledge sharing environment which is centred on virtual communities of practice (vCoP). The study is qualitative in nature, involving a number of data collection instruments, as it seeks to understand a number of aspects of the knowledge sharing environment. These include the antecedents necessary for the creation of the ESN enabled environment, the motivators for and barriers to participation, and the perceived organisational and individual benefits of increased staff knowledge sharing activity.

The study was not initiated by any stated desire on behalf of the organisation to improve staff knowledge sharing activities, but rather by me in my former capacity as IT Manager of the Institute, through recognising the lack of staff interaction and collaboration and seeking ways to overcome these shortcomings. Through three cycles of action research, the study develops a set of practical recommendations for using social media in the form of ESN for staff knowledge sharing. The study discusses the role of the knowledge sharing environment in the context of broader issues within the organisation and the sector that influence its development and performance. From this discussion, a number of conclusions with implications for practice and further study are developed. The study concludes that organisational culture and structure are major barriers to staff knowledge sharing and this is exacerbated by the existence of a divide between faculty and other staff. ESN and vCoP can help to build an active knowledge sharing environment but a critical mass of staff will only be suitably motivated to participate with a change to a

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[1] See www.hea.ie for further information.

transformational culture within the organisation. The study adopts a novel approach by demonstrating that action research can be used to influence practice policy making in higher education. It also extends the existing knowledge management literature by using an educational organisation as a focus for the research, thereby including HEIs as benefactors of the knowledge management process.

This chapter is designed to guide the reader into the field of research and to provide broad indications of what lies ahead in the thesis. It provides a background and motivation for the study, and a justification of why the study is relevant and of sufficient importance to undertake. The subject area is clearly defined and in doing so, attempts to delineate the focus for the research, leading to an expression of the research objectives. A detailed portrayal of the specific original context within which the study is located is presented, along with a clear expression of how the thesis relates to professional practice. The relationship of the study to previous research and theory on the topic is presented and a brief description of the methodology is provided.

The first person narrative is an accepted convention for reporting the findings of action research projects (Todres, 2007; Wertz *et al.*, 2011) and some parts of this thesis use the convention extensively. Rather than referring to the researcher in the third person, the first person will be used for this purpose as appropriate. As an action researcher in my own organisation, I have dual roles in this project. One is in my professional role within the organisation, which was IT Manager at the outset of the project, but which changed to Lecturer during the project, and the other is my researcher role as a participant in the professional Doctorate in Business Administration (DBA) programme at Waterford Institute of Technology's School of Business. The DBA programme is a four-year, part-time undertaking and is designed for practicing managers to develop expertise through the application of rigorous research design and analysis to a selected organisational issue. The application of theory to field-based research in pursuit of innovative executive and professional practice allows students to develop their ability to conduct empirical research to managerial areas of interest. I found the approach to be particularly useful for addressing some of the issues which are outlined in the rest of this chapter.

1.1 Background

The importance of knowledge as a strategic asset to any organisation is increasingly recognised in tandem with a growing awareness that economies and societies have

become more information and knowledge intensive (Hislop, 2013). Although, the concept was proselytised by a number of early authors such as Hayek (1945), Machlup (1962), and Drucker (1959), who used the term "knowledge worker", the main source for the contemporary vision of a post-industrial, knowledge society is arguably the work of Bell (1973). This vision is characterised by the replacement of manufacturing as the main source of employment with the service sector, in which information and knowledge play a far greater role, and encompasses an ever growing diversity of jobs that require the application and use of knowledge. According to Hislop (2013), much of the subsequent research into knowledge and its different aspects, and the development of knowledge management (KM) as a discipline, can be traced back to this vision. This view of the importance of knowledge to contemporary economies and societies is typified by Stewart (1997, p.9), who wrote that knowledge has become the "primary ingredient of what we make, do, buy and sell. As a result, managing it - finding and growing intellectual capital, storing it, selling it, sharing it - has become the most important economic task of individuals, business and nations." According to Al-Hawamdeh (2002), this recognition of knowledge as the driver of productivity and economic growth, has led to a new focus on the roles of information, technology and learning in economic performance, and has given rise to concepts such as 'the knowledge-based economy' and 'knowledge-intensive firms' that are popular in the modern theories of business and industry. Starbuck (1992) classifies a firm as knowledge-intensive when it attributes more importance to knowledge than other inputs such as capital and labour. Goffee and Jones (2015) assert that the need for organisations to develop their human capital, or knowledge assets, has long been recognised by knowledge intensive businesses, and that there is a long-term correlation between organisational performance and investment in human capital.

In general, although public higher education institutions (HEIs) would not be considered in the same light as profit-driven organisations, neither are they isolated from such contemporary views of the role of knowledge in society. HEIs are, by their very nature, knowledge intensive environments and their primary *raison d'être* is to create and disseminate knowledge through teaching, learning and research activities. For a number of economic and social reasons, and driven by national policy, public HEIs are increasingly being operated and managed as businesses, with increasing requirements to drive down costs, improve efficiencies and generate their own income (Rowley, 2000; Wohlmuther, 2008). HEIs are required to compete against each other for students in an

increasingly competitive, global marketplace, and in order to be successful they need to maximise their competitive advantage (Bloom, 2005; Cranfield and Taylor, 2008). Intellectual capital is the sum of everything that everybody in an organisation knows that gives it a competitive advantage, and, according to Rao (2010), the intellectual capital of an organisation can only be maximised through the application of KM practices. The importance of knowledge sharing to organisational success is also highlighted by Liebowitz (2001), who argues that organisations can attain competitive advantages through encouraging and promoting knowledge sharing. According to Swart and Kinnie (2003), the need for knowledge sharing is even more important in knowledge-intensive organisations such as public HEIs, where the sharing of knowledge and good practices is viewed as a key contributor if they are to gain the most from their intellectual capital and compete effectively in an ever expanding, global marketplace. Edvinsson (2002) maintains that the nature of competitive advantage is changing and is no longer based on market position, size and power, but on the incorporation of knowledge into all of an organisation's activities. Nunes *et al.* (2006) state that KM processes such as knowledge acquisition, storing, retrieving and sharing, should be seen as crucial and core by knowledge intensive organisations.

Therefore, it would seem logical that KM might form a key strategic concern for HEIs through which they could recognise, manage and use their knowledge assets. For example, Kidwell *et al.* (2000), believe that HEIs can derive significant value from developing initiatives to share knowledge for the achievement of business objectives, arguing that, if done effectively, KM can lead to better decision making capabilities, reduced development cycle time for curriculum and research, improved academic and administrative services and reduced costs. Nonaka and von Krogh (2009) assert that the outcome of knowledge sharing is the creation of new knowledge and innovation that will improve organisational performance, and a number of studies find that promoting knowledge sharing practices results in improved organisational effectiveness (Petrash, 1996; Gupta and Govindarajan, 2000; Olivera, 2000). However, a number of studies show that, although the external transfer of knowledge is effectively managed by most HEIs (Kok, 2007; Pinto, 2012), the management of organisational knowledge and the promotion of staff knowledge sharing is largely neglected, with low levels of KM implementation and knowledge sharing evident in these organisations (Ramachandran *et al.*, 2009; Fullwood *et al.*, 2013). A lack of KM implementation and knowledge sharing

therefore, has significant negative impacts on the intellectual capital and the overall performance of HEIs, similar to any type of organisation, commercial or otherwise (Sohail and Daud, 2009; Fullwood *et al.*, 2013). According to Ramakrishnan and Yasin (2012), speed of curriculum revision and updating, and quality of administrative and support services, are particularly impacted in HEIs. A number of reasons for this lack of KM implementation and knowledge sharing in HEIs can be garnered from the literature, among them: organisational structures (Rowley, 2000; Collinson and Cook, 2003; Lee, 2007); organisational culture (Rowley, 2000; Cronin, 2001; Lee, 2007); the bureaucratic nature of some types of HEIs (Tippins, 2003; Taylor, 2006), and a divide and mistrust between academic staff and administration staff (Castleman and Allen, 1995; Conway, 2000; Dobson, 2000; Szekeres, 2004).

Staff in HEIs, such as universities and institutes of technology, are generally classified into two distinct groups: academics and non-academics. The academic group consists of members of staff who perform the functions of teaching and research, whereas the non-academic group have roles that are predominantly managerial and administrative in nature. The focus of their work is in supporting the activities of academic staff, dealing with students on non-academic matters, or working in an administrative function such as finance, human resources, information technology (IT) services, facilities, and library. However, the delivery of support services in HEIs can often be poor and seemingly at odds with the goals and needs of the academic community (Wohlmuther, 2008). The nomenclature itself suggests that there is a significant divide between these two groups. According to Conway (2000), the term 'non-academic' defines this group by what they do not do, rather than by what they do, and is pejorative and exclusionary in nature. The tendency to describe support staff in this negative way also seems strange in an era of inclusiveness and equity, ideals which are widely promoted by HEIs (Dobson, 2000). For the remainder of this thesis, the US terminology of 'Faculty' and 'Staff' will be used to describe the two groups.

This divide is not new or simply perceived, as much of the research in the area substantiates its existence. Conway (2012) cites a 1966 speech by the noted botanist and educator Eric Ashby, in which he said "all Professors see all administrators as an evil. (If you are an administrator), say to yourself every morning 'I am an evil, but I am a necessary one.' " Szekeres (2011) describes staff as being an invisible group and Castleman and Allen (1995) maintain that staff have been a neglected part of the higher

education workforce with staff issues often being overlooked by management. Indeed, much of the literature seems to infer that the main reason for this divide is the attitude of faculty who see staff as unnecessary, interfering and controlling (e.g. Dobson, 2011; Szekeres, 2011). In any case, HEIs simply could not function without the existence of staff. Leaving the attitude of faculty and the sensibilities of staff aside, it is the manifestation of the divide between the two groups at an operational level that is most problematic for HEIs. A lack of understanding, trust and knowledge sharing between faculty and staff can lead to stifled development both within an institution itself and of the institution. The lack of understanding, trust and knowledge sharing is not peculiar to either group in relation to the other but is very much a two-way street, and is described by Conway and Dobson (2003) as "divergent value systems, and an interface that is less than positive". In order to address this problem, it is important to understand both why this divide exists and the rigid bureaucratic structures within institutions that perpetuate, and even encourage, its existence.

1.2 Motivation for Undertaking the Study

I began my career in public education as a lecturer at Limerick Institute of Technology in 1998, before taking on the role of IT Manager at the Institute in 1999. Although the main focus of the role was to develop and support the IT environment for the efficient functioning of the organisation, I always had a desire to further my academic qualifications beyond my Level 8 engineering degree, and managed to complete a master's degree in 2002 on a part-time basis. Although attaining a Level 10 qualification was always a goal, I had not given it any serious consideration until the opportunity to enrol on the WIT DBA programme presented itself in 2013. The decision to enrol was very much a last-minute one and when I went to the first workshop, I had not given any consideration to what area I was interested in researching, let alone a specific research topic. At that workshop, we were asked to talk about our research ideas, hence it was necessary for me to critically reflect on potential topic areas and present the ideas as part-completion of the workshop. I mentioned that I had an interest in the concept of "Big Data" and information management in general. It was suggested that I should look at the topic of KM and the work of Ikujiro Nonaka in particular (see: Nonaka and Takeuchi, 1995). I started reading some papers in this area and ended up investing a lot of time in learning about KM. Indeed, I found it curious that I was not really aware of KM as a discipline at all, having worked in IT management for some 15 years at that stage. Further

research into KM, and its limited application in educational contexts in particular, introduced me to a body of research on a perceived divide between faculty and staff, something that I was acutely aware was real enough through my own experiences working as both a faculty and a staff member. I began to look at how KM techniques might be applied in higher education contexts in order to bridge the faculty staff divide and overcome some of the problems associated with it, such as lack of knowledge sharing within organisations. From a practitioner stance, I really wanted to understand how IT service delivery might be improved by using these techniques to gain a greater understanding of faculty requirements.

One of the most promising KM techniques for the promotion of knowledge sharing appeared to be Communities of Practice (CoP). The idea of CoP was first introduced in 1991 by the cognitive anthropologists Jean Lave and Etienne Wenger and describes a group of people who share crafts or professions or areas of common interest, and they can evolve naturally or be created specifically (Lave and Wenger, 1991). I realised that if a space could be created where both faculty and staff members with common interests could come together in informal groups and settings to share knowledge, new ideas would flourish and thereby service delivery could be improved. The possibility for CoP to circumvent the existing rigid bureaucratic organisational structures, which simply stifle any sort of real knowledge sharing (Parker and Bradley, 2000; Bannister, 2001), was particularly attractive. In looking for ways in which this might be done, I discovered Web 2.0 tools for KM, which are essentially social media tools such as social networks, blogs and wikis. Social media are computer-mediated tools that allow people to create, share or exchange information, ideas and media in virtual communities and networks (Kaplan and Haenlein, 2010). The application of these technologies within workplaces to facilitate work-related communication and collaboration is referred to as 'enterprise social networking' (Richter and Riemer, 2013). According to Lewis and Rush (2013), Web 2.0 tools can be applied to the enablement of virtual CoP, which would be particularly useful in a multi-campus environment, such as that in LIT.

One area of concern was that much of the KM literature was published in the 1990s and 2000s and there was little recent research into KM. Indeed some authors suggested that KM was nothing more than a passing management fad and would not survive as a practice (Scarbrough and Swan, 2001; Wilson, 2002). The perception of KM systems as IT-driven, knowledge repositories added to this view, with Goffee and Jones (2007, p.4) claiming

that "the failure of such systems to capture tacit knowledge is one of the great disappointments of knowledge-management initiatives to date." However, the reality appears to be that the use of corporate social media tools has given somewhat of a new impetus to KM and it has re-emerged as a business discipline (Stankosky, 2005; Laal, 2011). According to Levy (2009), these tools have the capability to refresh KM practices because they have a special collaborative and sharing emphasis, and because people will expect to find and use them in organisations.

Although the research question was taking shape, it still encapsulated a number of different things, such as a faculty staff divide, KM, CoP and social media tools, and needed much greater refinement. At this point, I struggled with identifying a philosophical stance for the research, and perhaps failed to understand the need to do so. I have applied my engineering training throughout my working life and take a logical approach to everything. It took time to realise this is simply looking at things from a pragmatic perspective. Combining pragmatism with critical realism appeared a logical stance for me to take for the research as it allowed me to acknowledge my place within the research and the impact that that might have on the results. I fully recognized that *a priori* knowledge and existing values would invariably intrude upon the observation, and once I had developed this understanding, I determined that an action research (AR) strategy would be most appropriate for the study. AR involves the active participation of the researcher and seeks to bring about change within the subject organisation. It is an iterative process constructed with a longitudinal design to allow time to examine changes as iterations of the research progress (Baum *et al.*, 2006). According to Baskerville and Myers (2004), the goal of AR is to solve existing practical problems while generating scientific knowledge at the same time, and this view supports the dual aspects of this project.

Once I had adopted a philosophical stance and decided on an appropriate research strategy, the refinement of the research objectives became a priority. This progressed during the production of the Conceptual Paper, Paper 1 of the Research Paper Series, where I began to explore the links between social media tools and CoP (e.g. Chatti *et al.*, 2007; Schneckenberg, 2009). Although the concept of CoP developed largely as groups that physically met with each other, the usefulness of ICT in the development and expansion of CoP cannot be underestimated (Pan and Leidner, 2003). In particular, where community or team members are geographically dispersed, ICT has a significant role to

play in the facilitation of meeting and knowledge sharing (Gibbs *et al.*, 2012). As social media tools provide many opportunities for the exchange of ideas, information and knowledge (Lewis and Rush, 2013), this technology has particular relevance to CoP and can be used to create what is termed a 'virtual community of practice'. A virtual CoP (vCoP) can be fully online or partially online, with some members meeting face-to-face and then communicating with other remote members online. The discovery of the suitability of social media tools, and ESN in particular, for facilitating vCoP, proved to be the genesis for the refinement of the research objectives. From my perspective as a practitioner, the development of a knowledge sharing environment, focussing on vCoP underpinned by ESN, seemed to be a logical way of not only bridging the faculty staff divide, but also improving communication, interaction and collaboration across the organisation, thereby fulfilling my original goal of improving IT service delivery. This would now be possible because we, as IT service providers, would have a much greater understanding of the needs of our customers. From a research perspective, understanding how such a knowledge sharing environment would work in practice became the focus. During the first (Diagnosing) phase of the first AR cycle, this led to the development of a Conceptual Model which could be empirically examined during subsequent phases.

In my role as IT Manager, I was in a position to examine suitable social media tools that might be useful for supporting the knowledge sharing environment. My team considered various applications before we decided to implement an ESN called Yammer. Yammer was developed as an independent product and launched in 2008. It was acquired by the Microsoft Corporation in 2012 and subsequently included in their Office 365 offering in 2014. As Microsoft products are widely used in the organisation, it was decided to make this tool available to all staff users.

1.3 Research Aims and Objectives

The conceptual model developed for this study (Figure 1) suggests that the implementation of an ESN in a HEI, and the promotion and support of its use in vCoP, will enable staff knowledge sharing activities, providing a number of individual and organisational benefits. The formal objective of this research is:

> to examine how enterprise social networks can enable staff knowledge sharing in virtual communities of practice in higher education.

Figure 1. Conceptual Model
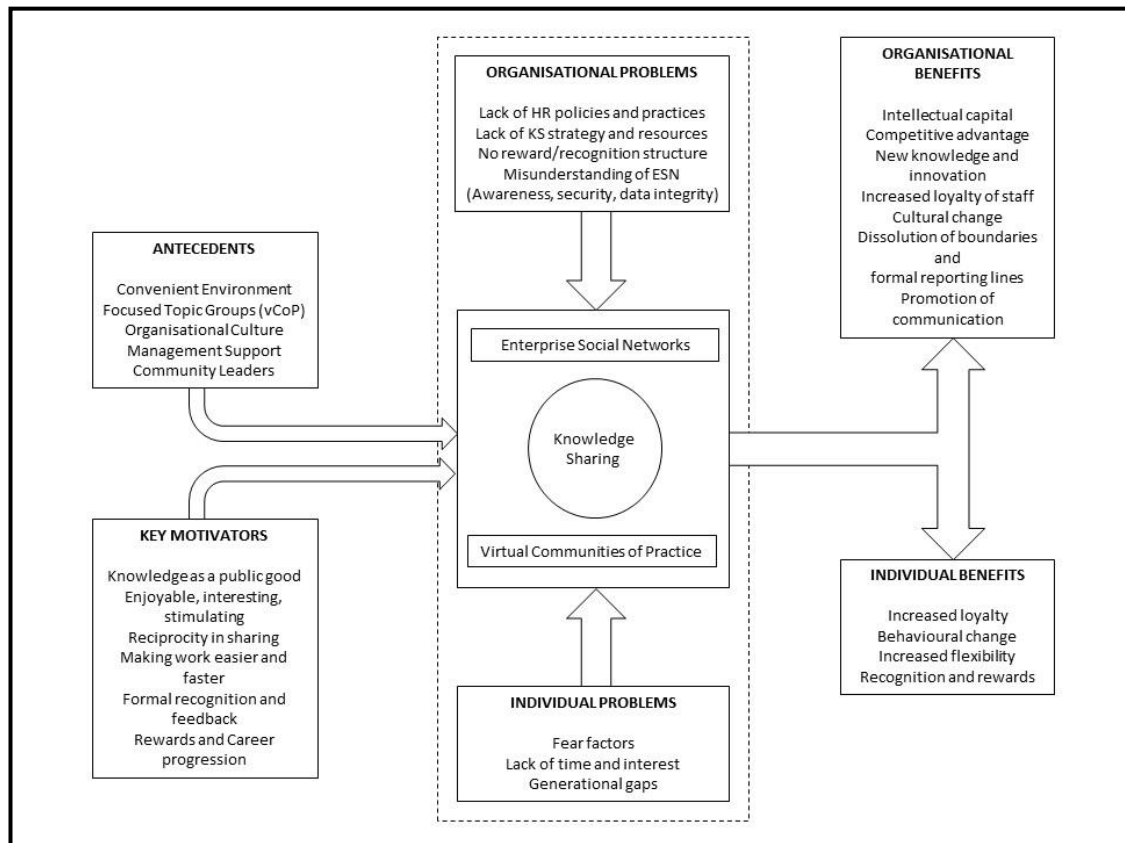
A number of research questions were developed to examine the inputs and outputs of the model in detail, and are as follows:

1. What are the antecedents for staff knowledge sharing? What needs to be in place for the successful implementation of ESN tools such that knowledge sharing will take place in vCoP.

2. What are the dominant problems associated with the implementation of ESN and participation in vCoP?

3. What are the perceived benefits of knowledge sharing for both the organisation and for staff members?

4. What are the key motivators for staff to adopt the use of ESN and participate in vCoP?

1.4 Research Process

This action research study was undertaken at Limerick Institute of Technology (LIT)[2], a public higher education institution in Ireland, over a 12 month period from September 2015 to August 2016. LIT is one of thirteen IoTs[3] in Ireland, with approximately 6,500 students and 600 staff, and is currently the fourth largest IoT in the country.

1.4.1 Overview

As an AR project, this study engaged a number of AR cycles in which I followed a process of *Diagnosing*, *Action Planning*, *Action Taking*, *Evaluating* and *Specifying Learning*, illustrated in Figure 2, and adapted from a model developed by Susman and Evered (1978). The first phase (*Diagnosing*), involves the identification of primary problems that are to be addressed within the host organisation, and is considered to be an integral part of the research design. Before the first AR cycle begins in reality, this phase involves identifying the problem at the outset and then undertaking a review of the existing literature to help frame and develop a conceptual model for the study (see Figure 1). The *Action Planning* phase involves the consideration of alternative courses of action for addressing the problem, resulting in a package of interventions for each AR cycle, guided by the conceptual model for Cycle 1, and for subsequent cycles by an evaluation of the outcomes of preceding cycles.

Action Taking, sees the implementation of the planned interventions over a specified period; in this case, three months per cycle. According to Coghlan and Brannick (2014), in AR, data comes from engagement with participants in the AR cycles, so it must be acknowledged that data collection instruments themselves must be recognised as interventions. For this study, data was collected from focus groups, semi-structured interviews and content analysis. Following the assertion by Coghlan and Brannick (2014) that data generation in AR comes through active involvement in the day-to-day organisational processes relating to the AR project, it can be considered that data will be generated from participation in and observation of groups and individuals at work, problems being solved and decisions being made, and also from the interventions that are made to advance the project. Some of these interventions and observations are made in the formal context of the AR cycle design, but more are made in informal settings, through

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[2] See www.lit.ie for further information on Limerick Institute of Technology.
[3] See www.ioti.ie for further information on the Institute of Technology sector in Ireland.

casual meetings and conversations, through emails, instant messaging and other forms of communication. Reflections on all of these occasions and occurrences need to be documented and this highlights the importance of reflective journaling in AR projects. These reflective accounts provide an important source of data for use within the study and can be used to supplement primary data from other sources (Jasper, 2005).

Figure 2. Phases of the AR process, adapted from Susman and Evered (1978)
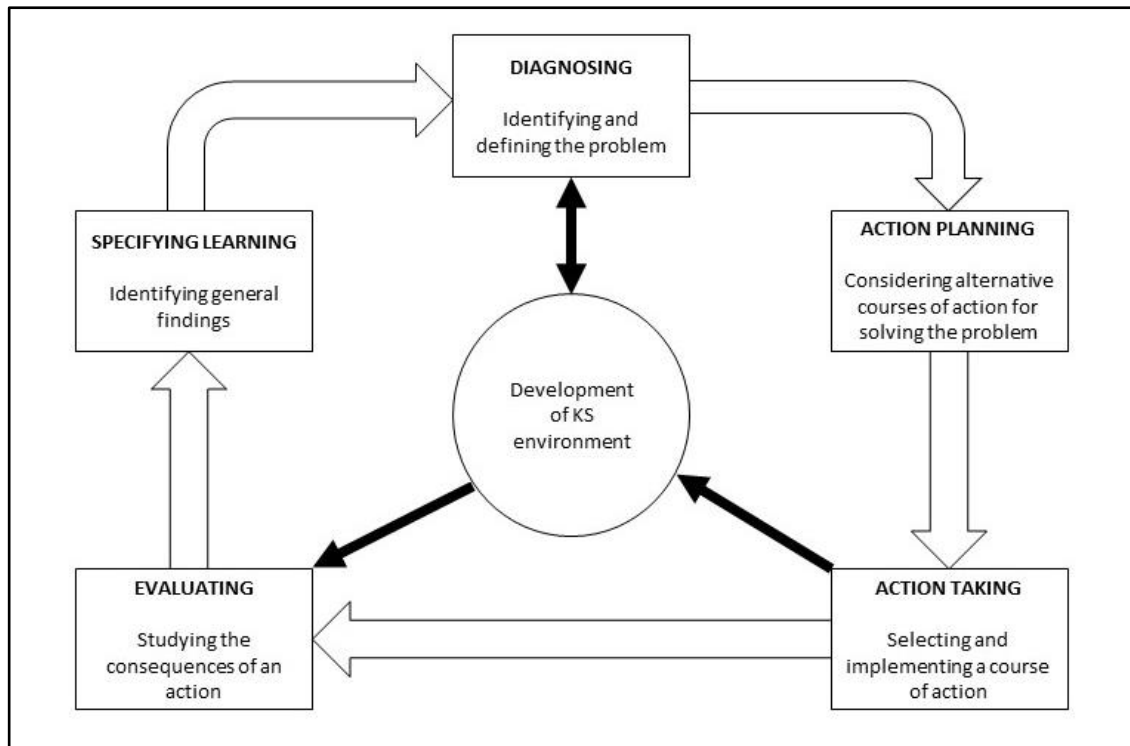
The analysis of reflective writing may be approached in the same way as any other narrative data using techniques such as structured content analysis. However, Scanlan *et al.* (2002) suggest the adoption of a more holistic approach, using the journal data to influence the analysis of the data collected from other primary sources. As reflective writing generates data that reflects the researcher's interpretation of the topic, it serves to focus the researcher's analytical lens to provide a unique analysis of the total data set (Jasper, 2005). For this study, I used reflective journaling extensively to capture my interpretations of interventions and any events related to the project, and an adapted reflective analysis technique from Gibbs (1988) to develop interpretations of the interventions.

The *Evaluation* phase analyses the interventions to determine their effectiveness relative to the conceptual model. In addition to analysing the data collected from the focus groups,

interviews and content analysis, reflective journaling again plays a central role. The final phase, *Specifying Learning* has slightly different aspects during cycles of the AR project than at the end. During the AR project, this phase feeds results into further diagnostics such that further actions may be planned for the next cycle of the project. At the end of the AR project, output from this phase is presented to the organisation and the scientific community (Olesen and Myers, 1999).

1.4.2 Implementation

Figure 3. AR Cycles & Methods (Sep 2015 - Aug. 2016)
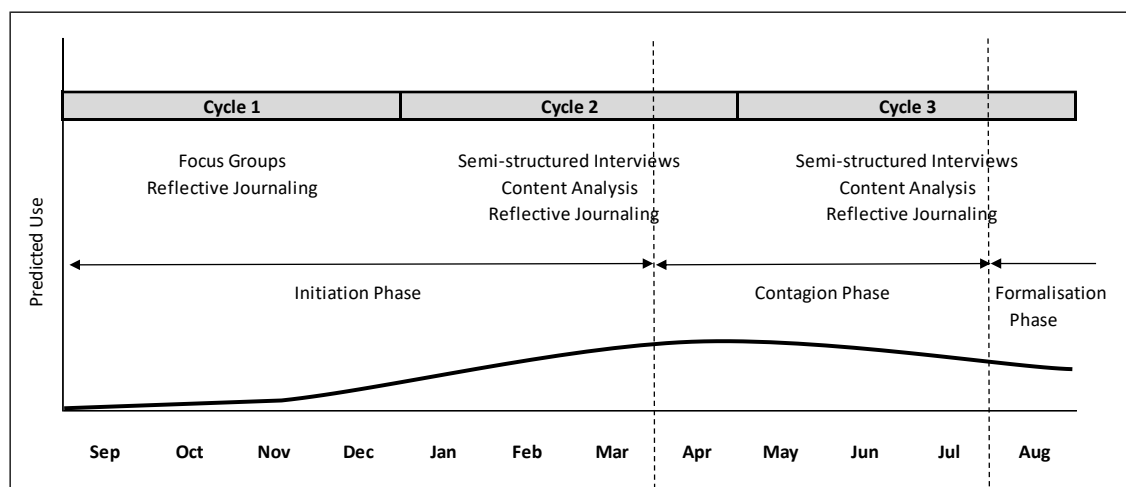
Cycle 1 of the AR project was concerned with the technical establishment of the knowledge sharing environment and setup of a number of vCoP. The ESN application, Yammer, is a social network that's entirely focused on a business. It facilitates group conversation and collaboration and has many similarities to familiar social media tools such as Facebook and Twitter. Yammer has a feature called Groups that directly facilitates the hosting of communities online and provides an environment where they can have conversations, share files, post comments, etc. These features make it a suitable tool to support vCoP and it was selected for this project on that basis. A communities' portal was implemented to act as a collection point for all of the vCoP in the organisation, and allows users to see what communities are active, join communities or create new ones. The technical implementation of Yammer and the portal was seamless, and users can join the ESN and navigate the communities with very little guidance, indicating that there are very few technical barriers to ESN implementation. Following an exploratory process, a number of vCoP were set up as Yammer Groups in conjunction with community leaders - staff members who had expressed interest in establishing communities. Community

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leaders are seen as a vital component for the successful operation of CoP, and they must have a good understanding of the different aspects of the role such as organisation and facilitation (Kimball and Ladd, 2004). Training on CoP and Yammer was provided for communities, including training for the community leaders. As the number of users and activity on Yammer increased, a number of ESN champions were identified. According to Coakes and Smith (2007), these are typically highly active users who are immediately comfortable with using such systems and are seen as crucial to stimulate its growth and attract more users. These users were engaged in order to create a more formal recognition for their role and to empower them to promote the ESN in the organisation. The main data collection instrument employed during Cycle 1 was focus groups, with three vCoP participating in facilitated discussions on themes of knowledge sharing, ESN and CoP.

Cycles 2 and 3 of the AR project produced further packages of interventions which were based on the evaluations of the interventions carried out in the previous cycles. Both of these cycles focused on growing the user base on the ESN, fostering the development of the established vCoP and promoting the establishment of additional vCoP. A number of initiatives to increase the number of Yammer users were introduced, such as providing additional functionality external to vCoP, such as support groups, working groups, department groups, and information feeds. This led to a number of groups being established on Yammer that might not be considered as communities of practice, such as department groups and academic course groups, with a number of others established for particular purposes, such as organising events and conferences, which could be considered as project groups. The establishment of this type of group is considered important to the long-term viability of the ESN as they engage staff who might not otherwise have had a reason to use the platform. Awareness campaigns were conducted during both cycles, and these included mass emails, advertisements on information portals and digital signage, Webinars and live training sessions. Management support was identified in the Conceptual Model as an antecedent for the development of a successful knowledge sharing environment, and members of the management team were engaged throughout the AR project with a view to increasing their participation levels and helping to promote the ESN and vCoP amongst their staff. The main data collection instrument employed during Cycles 2 and 3 was semi-structured interviews, with participants selected through a combination of stratified and purposeful sampling techniques. In all, 30 interviews were conducted, yielding over 22 hours of recorded audio, which was

transcribed and analysed with the aid of NVivo software. The philosophical and methodological considerations guiding this work are fully outlined in Papers 2 and 3, which are presented in Section 2.

1.4.3 AR Considerations

There are a number of dilemmas facing action researchers during the AR process, including some ethical issues that may not be present in alternative research approaches. For example, in AR, the researcher has what some authors describe as an over-involvement with the research (Rapoport, 1970; Mumford, 2001), and this can have consequences for both the researcher and the participants. Researchers and participants have to work closely together, increasing the likelihood of confidentiality and anonymity becoming issues (Williamson and Prosser, 2002). An additional problem of AR, proposed by Rapoport (1970), is that the researcher can be faced with a goal dilemma, that is, how to manage the practical expectations of the project while also achieving sufficient research outcomes. The researcher must remain mindful that the research aims must be achieved, while also delivering on the practical improvements to practice that the project sets out to deliver. Because of the participation of the researcher, AR is sometimes criticised in terms of what Baskerville and Wood-Harper (1996, p.241) refer to as "consulting masquerading as research". Care must be exercised by the researcher to ensure that the research remains rigorous and this can be achieved by detailed documentation of methods, interactions, observations and the maintenance of the reflective diary throughout the project. Coghlan and Brannick (2014) highlight the usefulness of journaling in coping with and exploring ethical issues in AR and pay particular attention to the reflective aspect of this practice. This view is supported by Smith (1999), who indicates the significant influence of written reflections on the ethical and methodological rigour of a study. According to Greenwood and Levin (2006), AR is essentially a balancing act between three elements: research, participation and action, and I aimed to ensure that a balance was achieved between these elements in this study.

Because an AR project influences change in organisations, the informed consent of participants is entirely necessary. However, it may not be clear as to exactly what they are consenting to, as neither the participants or the researcher know what actual changes may occur (Hope, 1998). To overcome these issues, a number of approaches are presented in the literature, such as the development of a mutually acceptable framework (Rapoport,

1970), following strict guidelines (Koshy *et al.*, 2010), and having an agreed set of procedures and principles (Loewenson *et al.*, 2014). The importance of an ethical code is stressed by Williamson and Prosser (2002), and Coghlan and Brannick (2014) highlight the usefulness of journaling in coping with, and exploring, ethical issues in AR. A number of these issues are addressed in detail in the preface to Paper 3 in Section 2, including the development of an ethical framework for the study. I also submitted proposals to the Research Ethics Committees at LIT and WIT, both of whom granted approval to undertake this research.

In shaping the overall approach to the data analysis, relevance to the research questions is of fundamental importance, and I believe that the validity of the analysis was strengthened by an iterative reference to the research questions and the research framework throughout. I also found this to be very helpful in maintaining focus while probing the data. I focused on analysing the data to answer the specific research questions and tried not to get side-tracked by answering diverging questions, many of which arose during the analysis. I transcribed all of the interviews which facilitated a re-engagement with the data before the coding process began, and this process uncovered a number of useful findings. I predominantly followed the methods developed by Bryman and Bell (2011) for analysing the interview transcripts. These methods require an extensive reading of all the transcripts together to try and recognise patterns before any coding process begins. Following some manual coding of the transcripts using Microsoft Word, I used the NVivo 11 application for the more extensive, final coding process, and particularly for the combination and reduction of codes to produce categories. Although NVivo proved useful for handling such a large amount of data, I was mindful of some of its shortcomings. For example, Gibbs (2004) cautions against being over reliant on the technology, emphasising that the researcher must interpret the data and not the computer. I also feel that using NVivo might encourage the user to code every part of the interview transcripts without taking time to think and reflect upon data, which could lead to an overly descriptive and ordinary analysis. As it is easy to do, there may also be a temptation to extend the coding beyond any real benefit for understanding the data. Furthermore, because coding is based on a given set of categories, one of its weaknesses is that it can establish "a powerful conceptual grid" from which it can be difficult to escape, potentially reducing opportunities to discover emergent themes (Silverman, 2000, p.825).

The development of the four papers for the DBA Research Paper Series provided an opportunity for a constant evaluation of the AR process, resulting in a highly refined process towards the end of the research. Writing the papers also helped me to construct a coherent and plausible thesis from the messy and sometimes incoherent data that the AR process generated. In effect, writing the papers can be likened to another cycle of the ongoing research activity. Because AR requires a continuous process of reflection combined with an analysis of the data, it becomes an inductive process that generates meaning from the data. The process of writing about it requires the incorporation of "disparate elements into a coherent whole" (Dey, 2003, p.245), so that the researcher can address the stated research aim and questions, and produce an account that is of sufficient quality from a research perspective, whilst remaining accessible to the reader. This is of particular importance for AR projects where the participants own the findings as much as the researcher, and those findings must be accessible to them (Williamson and Prosser, 2002).

1.5 Contribution and Significance

There is a growing awareness amongst practitioners and researchers that the implementation of social media in organisations, and in particular the use of ESN, has given a new impetus to KM. However, limited research has been conducted on applications of social media for organisational knowledge sharing, and especially in higher education contexts (Cheng et al., 2009). In examining how ESN tools can enable staff knowledge sharing in vCoP in a HEI, this research has produced a number of findings informing both theory and practice, and which can be used as a basis for further research. The management of HEIs in particular should be concerned with the strong evidence uncovered for the existence of a divide between academic and other staff. The identification of the importance of management support for the establishment and use of ESN for vCoP and knowledge sharing also has implications for management in HEIs who wish to improve their KM capabilities. The study findings indicate that the development of a strong knowledge sharing environment can have a positive impact on organisational culture, helping to break down social divides and eliminate silos. Studying the further development and the ongoing activities of the ESN and vCoP will help to see how this can be achieved in practice. In addition, given the extended time-frame required for achieving critical mass with the implementation of any knowledge sharing environment using ESN tools, long-term studies are required to fully understand the implications of

achieving strategic goals for knowledge sharing, both in terms of the derived benefits to both the organisation and individuals, and also for the culture of the organisation.

The study adopted a novel approach by using an AR design and applying it to an information systems implementation in the context of higher education, and demonstrates that AR can be used to influence practice policy making in higher education. It also extends the existing knowledge management literature by using an educational organisation as a focus for the research, thereby including HEIs as benefactors of KM processes. In confronting the ethical issues and developing an ethical framework, including an ESN Acceptable Use Policy and code of ethics for vCoP, this study should be of interest to other practitioners and researchers working in this area. This research also provides a contribution to the limited understanding of handling ethical issues in AR studies in the KM arena.

1.6 Publications

During the course of the research project, I took the opportunity to submit research papers to a number of conferences, and details of these are provided in Appendix 1, including examples of reviewers' comments and feedback. The conferences were well distributed over the course of the DBA lifecycle, with two or three per year. I also presented these papers at the conferences to audiences of mixed nationalities and backgrounds, but mostly to academics and practitioners working in the knowledge management and social media fields. I found the questions and feedback that I received at these conferences to be of great value in shaping my thoughts on both the research agenda and process. I received a number of offers for journal publications from these conference presentations and one paper has been published with further papers in progress. I found that the paper review processes helped with my writing style and particularly in how I presented material to the audience. Although the reviewers invariably described my papers as well written, which was somewhat comforting, I was able to identify a number of weaknesses in my presentation that I had to address. For example, the necessity to provide a strong justification for the research, rather than suggesting it is being done just because it has not been done before; strongly linking the introduction to clearly stated objectives and intended contributions of the manuscript, and using a review of the literature to lead to the development of the conceptual model, were all aspects that I needed to work on and

felt got better in later papers. The learning experience of the paper writing process also helped me with the assimilation of the various parts of the thesis into a coherent whole.

1.7 Thesis Structure

This thesis is divided into three main sections. Section 2, the Research Paper Series with prefaces, forms the core part of the research study and provides an overview and justification for the conceptual development of the work, the research methodology, and a presentation and discussion of the findings. This is bookended by an Introduction (this section) and a Discussion and Conclusion presented in Section 3. The thesis finishes with a reflective piece, including extracts from my reflective journals.

1.7.1 Section 1: Introduction & DBA Research Overview

The introduction provides the background to the study by illustrating the value of knowledge and the discipline of knowledge management to organisations in general, and HEIs in particular. It moves on to consider my motivation for the study through exploring my own experiences of IT service provision and management in my organisation, and the problems that I encountered as a result of a lack of communication, interaction and knowledge sharing. The research aims and objectives are stated before a detailed description of the research process is presented, including some considerations of the AR process.

1.7.2 Section 2: Research Paper Series

This is the main section of this thesis and is compiled from the four research papers that were produced during the research process. It should be noted that these papers have been examined by a panel of internal and external examiners, and the revised papers that were submitted after the examination process are included in the thesis in that unchanged format. Each of the four papers is preceded by a short preface which effectively serves as a linking narrative between them. This is necessary for coherency as each of the four papers were produced at different points in time during the research process. This compensates for the fact that the research papers themselves cannot be amended, and allows for the articulation of relevant points which were not evident at the time of the paper submission but have since come to light. The prefaces also facilitate an explanation of how the outcomes and feedback from the research paper series reviews influenced the developing research process.

1.7.2.1 Paper 1: An Evaluation of Using Social Media Tools for Knowledge Sharing in Higher Education Contexts: A Conceptual Review

The conceptual paper provides much of the background for the study by carrying out a review of the literature around the main theory bases. The evolution of KM as a discipline is explored, including how information and communications technology is used for KM. This is refined by examining the relationship between social media tools and communities of practice, before applications of KM in higher education contexts are reviewed. This facilitates the introduction of the faculty staff divide and a general discourse on how organisational culture impacts on KM initiatives. The contextual setting for the study is described before a brief justification for an AR study is presented.

1.7.2.2 Paper 2: An Evaluation of Using Social Media Tools for Knowledge Sharing in Higher Education Contexts: Methodology

The methodology paper begins by focusing on enterprise social networking as the chosen social media tool for the study. The formal research objective is clearly stated along with a description of its development. This leads to the presentation of four research questions that were used for the study. The pragmatic critical realist philosophical perspective that I adopted for the for the study is explained in ontological and epistemological terms and justified in detail, leading to a defence of why AR was considered the most suitable research method for the study. The research design and methods are presented, including a description of the proposed AR stages with planned interventions and anticipated outcomes. The design of the data collection instruments is described before some practical and ethical issues that are peculiar to AR are considered.

1.7.2.3 Paper 3: Investigating Staff Knowledge Sharing in an Irish Higher Education Institution through Action Research: Implementation

The research implementation paper begins by presenting the research design, which includes a description of the AR process and the model adopted for the study. The different phases of the AR process are outlined, with considerable attention given to the early phases of Diagnosing and Action Planning, which constitute part of the research design process. A presentation of operational details and information on the ESN tools being employed is included in a description of the third phase, Action Taking. Descriptions of the design of the data collection instruments and procedures are also

presented here, and issues of validity and reliability in the context of this study are addressed. The implementation of the interventions for the first AR cycle is described and the initial findings from this cycle are presented. The findings are mapped to the research questions and also presented as a narrative. Finally, a summary of the initial findings is presented along with reflections on the first AR cycle.

1.7.2.4 Paper 4: Investigating Staff Knowledge Sharing in an Irish Higher Education Institution through Action Research: Findings

This paper is presented as a continuation of Paper 3 and describes the implementation of Cycles 2 and 3 of the AR project. Some practical elements of the data collection process are introduced, including the structure of the sample population leading to the selection of interview participants, and a brief description of the interview process. The development and implementation of the interventions packages for Cycles 2 and 3 are described, along with positive and negative outcomes. The key findings from the analysis of the data are presented as a narrative followed by reflections on the data collection and analysis. There is a consideration of my role as an action researcher, with particular emphasis on my interaction with participants during the data collection process, and a consideration of some of the limitations that I encountered, and how these were addressed.

1.7.3 Section 3: Discussion, Conclusions and Recommendations

This section interprets, analyses and evaluates the results and findings with regard to the conceptual framework, existing theory and previous empirical findings, leading to the development of the key practical and theoretical contributions that emerged from the study. The main conclusions are that organisational culture and structure are major barriers to staff knowledge sharing and this is exacerbated by the existence of a divide between faculty and other staff. Management have a significant role to play in shaping a knowledge sharing environment and this can be achieved through transformational leadership that recognises the existence of the postulated problems in the first instance, and then sets about changing the organisational culture to one where staff will openly and willingly share knowledge and collaborate with each other. The existence of vCoP are essential to build an active knowledge sharing environment, and community leaders and champions are pivotal to the success of vCoP and the ESN. In addition, staff must be suitably motivated to participate in the knowledge sharing environment, and this will only happen with a change to a transformational culture within the organisation. This section

concludes by presenting recommendations for practice, limitations of the research, and suggestions for further research.

1.7.4 Reflective Log – Extracts

A requirement of the DBA programme is the maintenance of a reflective log over the course of study. It is an integral part of underpinning roles as both a practitioner and a researcher and also a vital and rich source of data for the study itself (Costley *et al.*, 2010). This was particularly true in my case as I kept two reflective logs, one to capture my DBA experiences, thoughts and reflections, and another to perform a similar function for the AR project. Sometimes, these two logs became intermingled and I frequently used data from both in my reflections on interventions and their outcomes during the AR cycles. I used my research log to critically evaluate, interpret and justify a number of decisions that I made as part of the DBA programme. I also found that the reflective analysis technique that I used from Gibbs (1988), was useful for developing new ideas and getting back on track when progress seemed otherwise impossible. This section is presented as a narrative interspersed with extracts from both reflective logs.

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Section 2

RESEARCH PAPER SERIES

Paper1

An Evaluation of Using Social Media Tools for Knowledge Sharing in Higher Education Contexts: A Conceptual Review.

Preface

The development of the conceptual paper took place between June 2014 and September 2014, when it was presented at the Doctoral Colloquium at WIT. Further revisions based on reviewers' comments were made prior to submitting the final version in January 2015 and this version is presented here. The conceptual paper is essentially a literature review of the theory underpinning the study and it provides the theoretical foundation for the aims and objectives of the thesis in the specific context of professional practice. The process of developing this paper required a thorough engagement with the literature and this helped to develop the aims and objectives of the research. I explored a number of theory bases, including knowledge management, communities of practice, and corporate applications of social media, and their applications in higher education contexts. Working on the conceptualisation of ideas for each of these helped me to develop a more focused objective and some concept of the research questions necessary for the study. Although, the synthesis of the literature often leads to a well-developed conceptual framework for the project, my identification of action research (AR) as the most appropriate research technique, had an impact of the timing of the development of the conceptual framework, and ultimately the conceptual model. Because of the cyclical nature of the AR process, the development of the conceptual model generally happens in the first phase of the first cycle of the project, known as *Diagnosing*. In reality, this phase encapsulated the very start of the project, even before AR was identified as a suitable research methodology. However, the result of this is that the conceptual model is not fully developed until Paper 3 of this Research Paper Series.

At this stage of the project, my research skills were not very well developed, and I relied on a number of sources to guide the conceptualisation of my ideas. Although I had planned for a mixed methods approach, Mantzoukas (2008) provides a useful blueprint for formulating research questions for qualitative studies, emphasising that the questions should take the form of a declarative statement that provides focus on specific issues, while also being broad enough to allow for other variables to emerge from the data. Sandberg and Alvesson (2011) present a number of ways of constructing research questions by spotting gaps in the existing literature, such as: confusion spotting – looking for contradictions in the existing literature; neglect spotting – identifying areas that have been overlooked or under-researched; application spotting – identifying where the literature needs to be extended or complemented in some way; and problematisation –

which is about challenging assumptions underlying existing theory. Leshem and Trafford (2007) provide a clear understanding of what a conceptual framework is, why it is important and how it can be used in doctoral research.

My journey through this process had some significant ups and downs. Having invested considerable time in the KM literature, I had become very interested in the area and really saw its potential to address some of the practical issues around which the research objective and questions were forming. However, I came across some articles (Scarbrough and Swan, 2001; Wilson, 2002) which dismissed the entire discipline of KM as nothing more than a fad, and which launched a direct attack one of the central theories of KM, the SECI Model devised by Nonaka (1991), and the concepts of tacit and implicit knowledge proposed by Polanyi (1958), on which it was based. I found some of the arguments to be very persuasive and it took me some time following that to re-engage with KM as a discipline. In hindsight, I should have been more critical of these papers and this episode provided one of the more significant advances along the research learning curve for me. It was further research into CoP that brought me back on track, as I recognised the validity of CoP as a KM technique, and it was this connection that led to the recognition of social media tools as a new form of IT enabled KM. I can now recognise why those authors dismissed KM so readily, as it was largely perceived as a static, organisational, information-storage behemoth, with which users were reluctant to engage. KM would be better served with a new branding that disassociates itself from this perception. Linking it with Web 2.0 would immediately serve to refresh the perception of KM and associate it with principles of flexibility and ease-of-use, principles that are demanded by a modern, social media-savvy workforce. Most organisations now have a plethora of information systems and completely rely on email for communications. This presents a number of challenges for them in attempting to pursue information and knowledge management initiatives. They are faced with too many repositories, with different taxonomies, and too many places to search, all contributing to an increasing total cost of ownership. Employees are so wedded to using email as the primary communication channel that getting them to use anything else is a difficult task. Presenting KM initiatives under the guise of Knowledge Management 2.0 might just be a way to get workers to engage with these initiatives. KM 2.0 can be designed with a completely new approach in which the focus of KM becomes people-centric and seeks to build a collective intelligence through a bottom-up approach, with social software tools at its centre. Although presented in this

preface to Paper 1, I only developed this view of KM 2.0 towards the end of the project, but feel that it is important to include it.

Some of the early research questions that were emerging from the conceptualisation process were typical of the type of research questions that emerge early on, and were too broad and general, and not easily researchable (Bryman, 2015). For example, "Can social media tools be used to stimulate an environment for informal knowledge sharing activities, where vCoP emerge from the bottom-up?"; "Can social media tools act as change agents with the ability to have an impact on organisational culture?"; and, "What interventions are required to successfully implement social media tools for knowledge sharing activities?" Although all of these questions were focusing on how social media tools are used in organisations, they were not particularly useful in narrowing the research agenda. They also illustrate how questions with a simple yes or no answer should be avoided, which is the case with the first two. However, these questions did provide me with a reasonable starting point because, putting 'how' before them changes their focus completely and led me to think about how social media tools could be used for knowledge sharing and act as change agents. The third question, about the required interventions, eventually became an embedded part of the AR cycles and in particular, the *Evaluation* and *Specifying Learning* phases, where interventions used in one cycle were analysed and evaluated, leading to the development of a package of interventions for subsequent cycles. I decided that the research questions were not developed enough at this stage to present in this paper and they were eventually presented in detail in Paper 2, and are significantly different to the early attempts presented here.

A further problem that was emerging at this stage of the research process was the term 'social media tools'. In determining that social media tools had heralded the new wave of KM 2.0, I had conceptualised a suite of tools to underpin the knowledge sharing environment, including social networking, wikis, blogs, RSS feeds and any other tool that might be useful. I had attempted to map different tools to the SECI model (see Figure 1), developed by Nonaka and Takeuchi (1995), applying wikis and blogs to *Internalisation* and *Externalisation*, RSS feeds and social bookmarking to *Combination*, and social networking to *Socialisation*. This exercise led me to realise that the answers to the type of questions that I wanted to ask, lay firmly in the *Socialisation* quadrant of the SECI model, where tacit knowledge is captured and shared, leading to the development of new knowledge which can then be captured as explicit knowledge through *Externalisation*.

According to Shirazi *et al.* (2011), while this explicit knowledge in an organisation can be managed through procedural and technological changes, a far greater challenge to successful KM implementation is in managing tacit knowledge, and this requires significant cultural, structural and leadership style changes.

Figure 1. The SECI Model of Knowledge Creation (Nonaka and Takeuchi, 1995)
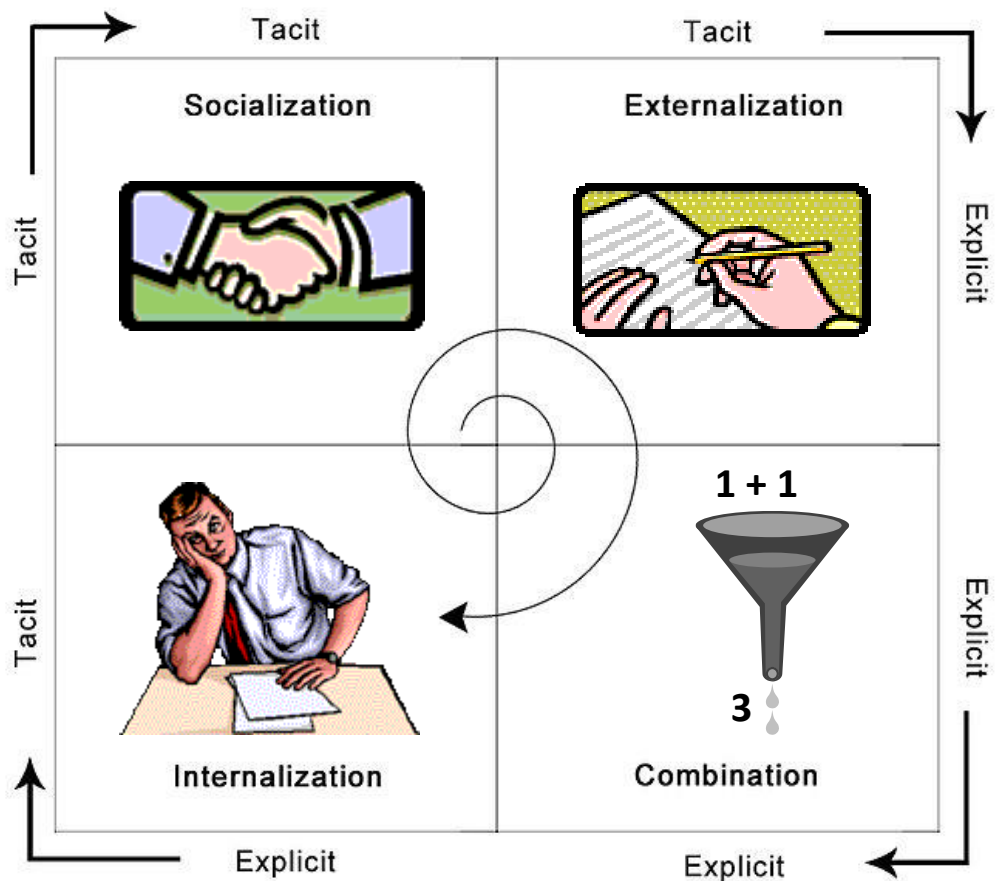
This led me to focus my thoughts on the *Socialisation* of tacit knowledge and the social media tools that might be used for that, ultimately narrowing the practical implementation to enterprise social networking. In researching the implementation of ESN, I began to look at some of the barriers to implementation such as organisational culture, structure and leadership, and found that these mapped to some of my earlier research on why KM initiatives in higher education had not been successful. This helped to clarify the practical problem for me and this is illustrated in Figure 2, which depicts the current situation in HEIs and the desirable situation, brought about by an implementation of KM 2.0 leading to a positive change in organisational culture.

Figure 2. An Illustration of the Practical Problem

Bureaucratic Structures
Governing Authority
Executive
Academic Councils
Subcommittees
Steering Groups

Disconnect
Mistrust
Divide

Different
Values &
Priorities

Loose Coupling

Poor service delivery
Inadequate infrastructure
Not aligned with T&L

Knowledge Management
Organisational culture
Knowledge sharing
Communities of Practice
Web 2.0 (social media)

Connected
Trust

Shared
Values &
Priorities

Working together

Quality service delivery
Quality infrastructure
Aligned with T&L needs

As a result of this thought process, an early conceptual model emerged (see Figure 3), although it was not sufficiently detailed or grounded in the literature to use as a framework for a study. However, it does provide an insight into my thought process and provide an indication of how developed the objectives were leading to the delivery of this paper. I was also looking at how the potential for knowledge sharing can increase by moving from individual learning to organisational learning through applications of personal knowledge management (PKM) and organisational knowledge management (OKM) (e.g. Bailey and Clarke, 2001), and this is captured in the conceptual framework. However, this was adding a new theory base to the research and I ultimately decided to exclude it altogether.

In looking at ways to manage the implementation of social media tools, I had become interested in Stages of Growth (SOG) models, which are grounded in innovation adoption theory. In general, the adoption of new innovations by a given population over time can be statistically described using a normal distribution (see Figure 4), where adoption moves through a number of stages from innovators through early adopters, early majority, late majority and finally, laggards (Rogers, 1995). SOG models are used to measure the penetration of information systems into organisations and can be useful in assessing the impact of interventions to increase their usage.

The conclusion of this paper expresses an aspiration to make a contribution to theory by developing a SOG model for the purpose of implementing social media tools for knowledge sharing in HEI contexts, and a practical contribution by developing a model that could be used by other organisations to manage similar implementations. Ultimately it will be seen that these aspirations were not realised at the end of the project, and the reasons for this are explained in further prefaces. However, my engagement with the theory of SOG models proved to be very useful in developing the research questions and helped to enhance my understanding of how information systems can either become institutionalised as successful implementations or stagnate and become abandoned altogether. This is consistent with similar findings by Duane and O'Reilly (2016) and Barnes and Lescault (2011).

Figure 3. Early Conceptual Framework
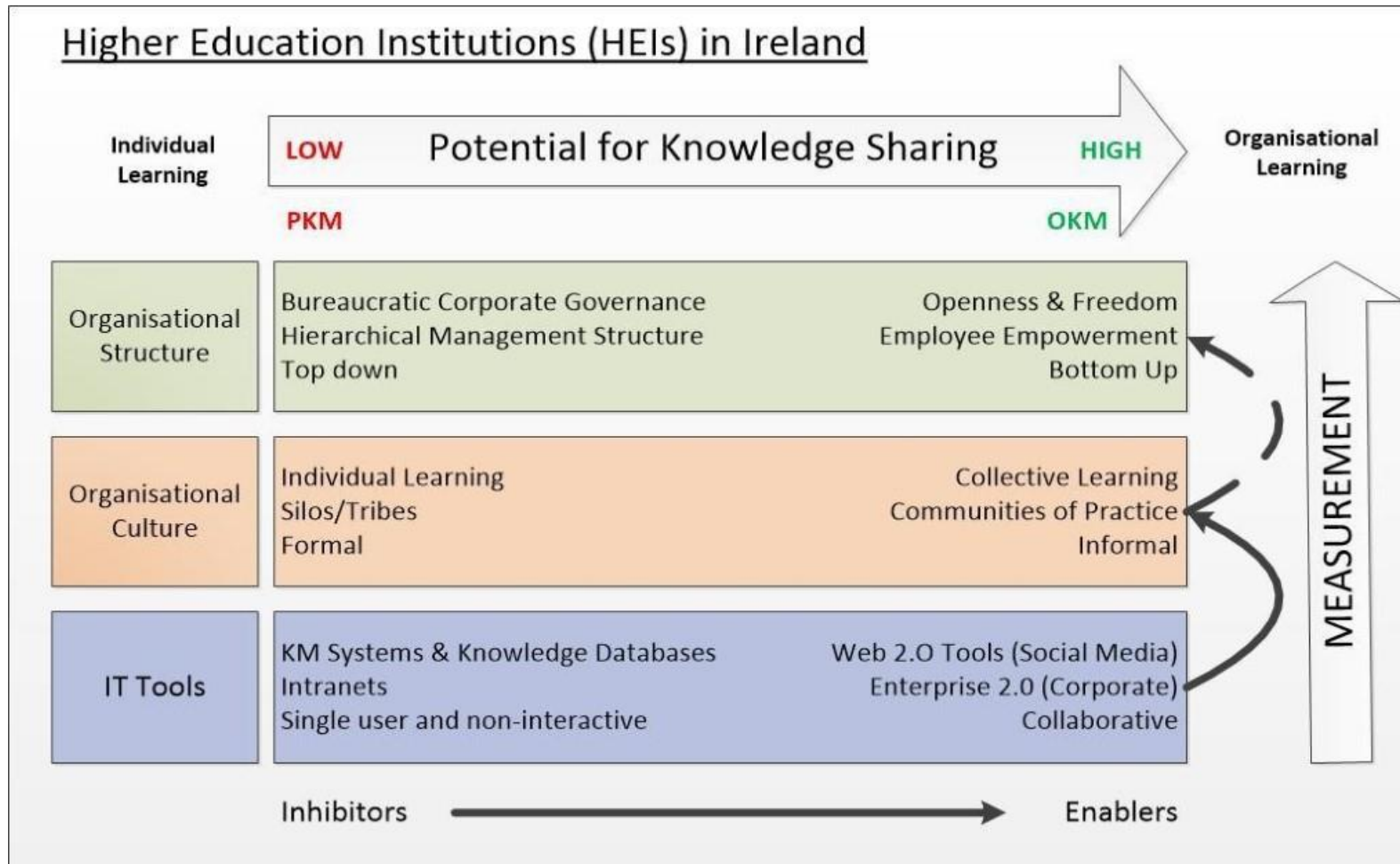
Figure 4. The Innovation Adoption Curve (Rogers, 1995)
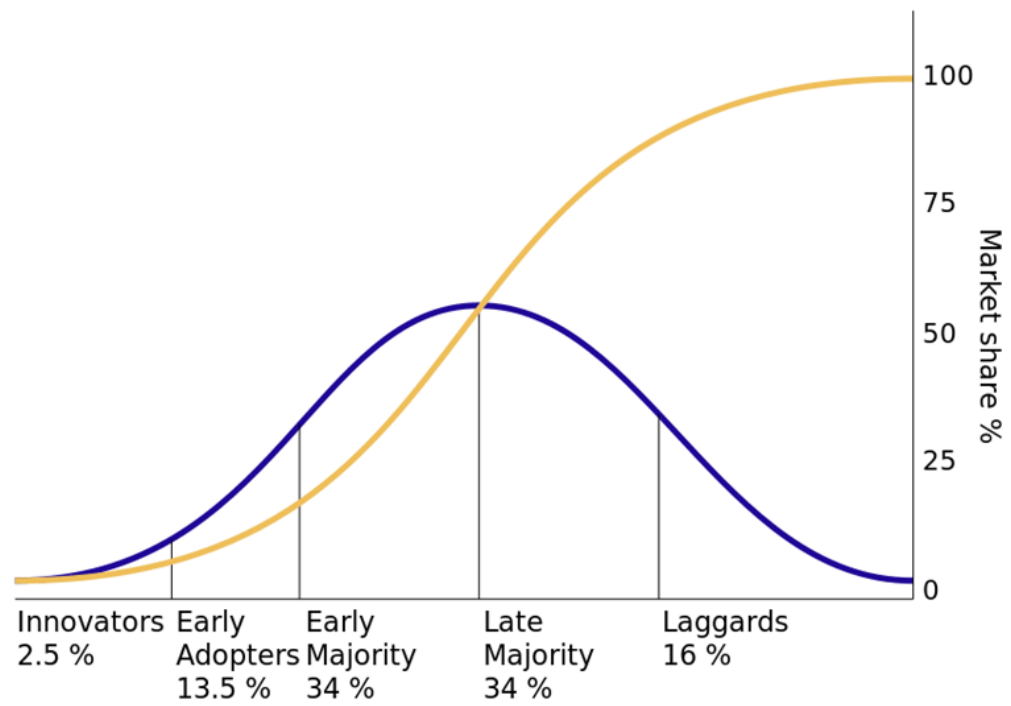
Abstract

Knowledge management practices are very little used by higher education institutions to either manage the sum of their intellectual capital as a strategic asset in order to gain competitive advantage in their marketplace, or for knowledge sharing amongst staff in general. Many reasons have been cited for this, not least cultural and structural arrangements that are contextually unique to these organisations. The systems based approach to knowledge management that characterised its early stages was also a deterrent for higher education and this, combined with a traditional top-down implementation in organisations led to a demise in knowledge management use in general. The rise of Web 2.0 techmnologies and the advent of social media tools has given somewhat of a new impetus to knowledge management, largely due to similarities between a knowledge management technique called communites of practice and social media. They both promote informal groupings and communication and can be implemented in organisations with a bottom-up approach. Both are seen as having significant potential to help to integrate knowledge management practices into higher education institutions; the lack of which is seen as somewhat of a paradox, given the knowledge intensive nature of these organisations. This study proposes to examine the implementation of selected social media tools in the context of a higher education institution by means of a longtitudinal case study framed in an action research. Stages of growth models will be used as a framework for the implementation and management of the social media tools and outcomes of the research will be an adapted stages of growth model for the contextual setting and improved understanding of the relationships between social media use and communities of practice.

1.0 Introduction

In the world of business it is widely accepted that organisations must harness their knowledge assets in order to gain competitive advantage in their market place. According to Nonaka (1991), "in an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge". In the contemporary knowledge society, every business is a knowledge business and every worker is a knowledge worker (Allee, 1997). Intellectual capital is the sum of everything that everybody in a company knows that gives it a competitive advantage, and the intellectual capital of an organisation can only be maximised through the application of knowledge management (KM)

practices (Al-Hawamdeh, 2003). However, organisations are increasingly aware that knowledge cannot be treated as an organisational asset without the active and voluntary participation of the communities that are its true owners.

Higher education institutions (HEIs) are, by their very nature, knowledge intensive environments and their primary *raison d'être* is to create and disseminate knowledge through teaching, learning and research activities. They also play a pivotal role in the external transfer of knowledge through interaction with business and other organisations in supporting innovation, entrepreneurship and social and cultural enterprise. There are two knowledge perspectives in HEIs which must be considered. These are academic knowledge, resulting from teaching and learning activities, and organisational knowledge, which is the knowledge of the business, its strengths, weaknesses, strategies, critical success factors, etc. (Pinto, 2012). It would seem logical then that KM would be a core business strategy of any HEI through which they could recognise, manage and use their knowledge assets. However, a number of studies have shown that KM implementation and knowledge sharing in HEIs remains at a low level and, further, that research into KM practices in HEIs is also limited (Fullwood *et al.*, 2013; Ramachandran *et al.*, 2009).

A number of reasons for the lack of KM implementation, and knowledge sharing in general, in HEIs can be garnered from the literature, among them: organisational structures (Collinson and Cook, 2003; Lee, 2007; Rowley, 2000); organisational culture (Cronin, 2001; Lee, 2007; Rowley, 2000); the bureaucratic character of some types of HEIs (Taylor, 2006; Tippins, 2003), and a divide and mistrust between academic staff and administration staff (hitherto depicted as faculty and staff respectively) (Castleman and Allen, 1995; Conway, 2000; Dobson, 2000; Szekeres, 2004). This lack of KM implementation and knowledge sharing has significant negative impacts on the intellectual capital and consequently the competitive advantage of HEIs, similar to any type of organisation, commercial or otherwise. According to Ramakrishnan and Yasin (2012), speed of curriculum revision and updating, and quality of administrative and support services are particularly impacted.

From its inception in the mid-1990s, much of the early focus on KM was from an information and communications technology (ICT) perspective (Hovland, 2003). Following an initial surge of interest, this system-led approach caused many to doubt the

viability of KM as a discipline and indeed it was dismissed by a number of authors as a passing management fad (Scarbrough and Swan, 2001; Wilson, 2002). Much of the organisational KM strategy also had a top-down implementation and was of a formal nature that required employees to enter knowledge into databases so that it could be used by others (Levy, 2013). It soon became apparent that these systems were of limited use for sharing tacit knowledge, the knowledge that people have in their minds that comes from experience and learning, did little to aid organisational learning and their use diminished (Bower *et al.*, 2001; Johannessen *et al.*, 2001).

However, according to Levy (2009), the rise of Web 2.0, and social media tools in particular, is bringing a new wave that should be adopted in KM practice. Social media tools have many similar characteristics to a KM strategy known as Communities of Practice (CoP), described by Wenger and Snyder (2000) as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements. The informality of social media can help employees fulfil their knowledge tasks and objectives (Alberghini *et al.*, 2014), and in many ways organisational applications of social media are close to some of the ideal principles of KM, which include the unrestricted sharing of knowledge, information and data (Razmerita *et al.*, 2009). According to Levy (2013), social media naturally suits the process of sharing tacit knowledge and thereby overcomes the limitations of the early KM ICT systems. They are also convenient for sharing knowledge in a bottom-up process as opposed to the top-down approach of traditional systems. In short, social media has given a new impetus to KM (Von Krogh, 2012), and placed it firmly back into business and organisational strategies.

This study proposes to examine the implementation of social media tools for knowledge sharing amongst staff in higher education contexts, with a particular focus on developing a stages of growth framework to model the process. The relationship between social media and CoP will also be examined as CoP are seen as a suitable KM technique to enable the requisite levels of knowledge sharing, particularly in the context of a multi-campus environment where staff members from the same departments are dispersed over significant distances. The remainder of this document will briefly introduce the concepts of KM and knowledge sharing, the use of CoP as a KM technique and a review of the use of ICT for KM, leading to the advent of social media tools and their suitability for KM. The literature on the use of KM in HEI contexts will be critically examined to highlight

some of the reasons why KM has not seen any significant implementation in HEIs to date. Finally, an initial research approach for the study will be presented, including an outline of specific interventions and the identification of possible measurement techniques.

2.0 Knowledge Management

According to Kidwell *et al.* (2000), KM is the process of transforming information and intellectual assets into enduring value and it connects people with the knowledge that they need in order to take action when they need to. It is an interdisciplinary approach to dealing with all aspects of knowledge processes including knowledge creation, capture, discovery, organising, sharing and transfer. It encompasses people, technology, organisation practices and processes (Al-Hawamdeh, 2002). KM is considered critical to obtaining competitive advantage in the corporate world and it is essentially about creating the environment where knowledge can flourish.

Drucker (1993) described knowledge as the primary source of productivity, innovation and wealth creation in globalised, post-industrial economies and coined the term "knowledge worker" as far back as 1959. The term "knowledge management" itself is attributed to Thomas A. Stewart who used it in a series of articles in Fortune magazine in 1991 (Ichijo and Nonaka, 2007). Ikujiro Nonaka and Hirotaka Takeuchi proposed a theory of organisational knowledge creation in their highly-cited 1995 book, 'The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation'. At the end of the 1990s, further work by Thomas Davenport and Larry Prusak provided practical applications of KM in organisational settings (Davenport and Prusak, 2000) and the discipline of KM gained considerable momentum.

Nonaka and Takeuchi's SECI model of knowledge creation is widely accepted as one of the definitive descriptions of how knowledge is created, shared and captured in an organisational setting. It builds on Polyani's (1958) description of two knowledge types, explicit and tacit, and provides very clear delineation between the two. They define explicit knowledge as that which is easily codified, storable, transferrable and easily expressed and shared. It can be found in manuals, policies and procedures, databases and reports. Tacit knowledge is defined as personal knowledge which is context-specific and is difficult to formalise, capture, communicate or share. It can be discovered in informal business processes and communications, personal experiences and historical understanding (Serban and Luan, 2002). Socialisation of knowledge refers to the transfer

of tacit knowledge between individuals though social interaction such as meeting and communication. Externalisation of knowledge refers to the capture of knowledge by recording and publishing tacit knowledge such that it becomes explicit and available to others. Combination of knowledge refers to the collection of explicit knowledge and combining, editing or processing it to form new knowledge. Internalisation of knowledge refers to the conversion of explicit knowledge to tacit knowledge through learning processes.

Wiig (1997) described KM as the logical next step in a sequence of societal developments that has been going on for a very long time. He proposed that KM will be fully operational for the average company in the first quarter of the 21st century before becoming outdated during the second quarter. However, both Scarbrough and Swan (2001) and Wilson (2002) suggested that KM would be an ephemeral management fashion or a fad and interest in the area would quickly decline. Indeed, Wilson was particularly scathing of KM in his paper entitled "The nonsense of knowledge management". He insisted that the work of Polyani and Nonaka and Takeuchi was flawed in relation to their definitions of tacit and explicit knowledge and that they confused knowledge with information.

Hislop (2010) found that there has been a significant decline of interest in KM amongst global consultancies and professional service firms, following an initial surge of interest and implementation during the 1990s and into the 2000s. Schultze (2008) argues that the reason for this decline can be attributed to a shift away from the implementation of large ICT based KM systems to a more people centric approach to KM. Many of these systems were being promoted by large consultancy and ICT firms during the 1990s and into the 2000s but following an initial surge of interest and implementation, the market declined rapidly. Studies conducted by Nicolini *et al.* (2008) and Hutchinson and Quintas (2008), found that there was more interest in using social-based rather than ICT-based systems for KM with implementations of small scale, informal initiatives which were linked closely to the day-to-day knowledge activities and problems that people carry out and have to deal with.

3.0 ICT and Knowledge Management

Although it is well established that KM is about people, technology is at the centre of all KM practice and has been one of the main drivers of KM as a management discipline. Indeed the role of ICT in KM has caused considerable debate and disagreement amongst

authors with many arguing that ICT has no relationship with KM at all and that ICT developers have no contribution to make to the KM movement (Galliers and Newell, 2003; Wilson, 2002). There are others who take the opposite view. For example, Holsapple (2005) describes modern KM as being inseparable from what he calls 'computer-based technology' and Stankosky (2005) regards technology as one of the four pillars that support KM. A middle ground sees McDermott (2000) take a reasonable view that ICT cannot deliver KM and Davenport and Prusak (2000) insisting that technology alone, while clearly being a part of KM, cannot make organisations more 'knowledgeable'.

Early ICT systems for KM, developed in the 1990s and early 2000s were large, customised systems that were very expensive and only installed by large organisations, with systems for small or medium enterprises not readily available (Nunes *et al.*, 2006). They required expensive consultants to develop them and technical staff to run them. Many of these systems were simply extravagant databases that required users to enter their 'knowledge' in order to build a corporate knowledge base (Galliers and Newell, 2003). This is partly why, despite an initial surge of interest in KM in the corporate world, it never really established itself as a mainstream management discipline outside of academia, with a corresponding drop in the number of consulting companies offering KM as a service to industry (Hislop, 2010).

The concept of Web 2.0 was predicted by an information architecture consultant in 1999 who saw the then static World Wide Web fragment into a transport mechanism which focused on interactivity (DiNucci, 1999). It took a number of years for Web 2.0 to develop and it was in the mid-2000s that it began to gain momentum, with the establishment of 'Web as Platform' where software applications are provided in the Web as opposed to on the desktop. Users are allowed to do much more than just retrieve information and can contribute to the content available. An example is the difference between the Encyclopaedia Britannica online and Wikipedia, with the first relying on experts to create articles and then uploading them periodically, whereas the latter relies on the end user to provide content so that articles are constantly produced and updated, with validity and relevance controlled by peer-review (Paroutis and Al Saleh, 2009).

Essentially Web 2.0 is now a collection of social software that supports group interaction towards establishing communities, and creating and exchanging content (Von Krogh,

2012), and is sometimes referred to as the 'social web'. Examples of Web 2.0 technologies are social networking sites, wikis, user-created Web sites, mashups, self-publishing platforms, blogs, RSS feeds, tagging and social bookmarking. Andriole (2010) has no doubt that Web 2.0 tools can help to improve collaboration and communication within most organisations and the application of these technologies in the business world is often referred to as 'Enterprise 2.0'.

Paroutis and Al Saleh (2009) argue that such technologies have distinct technical features that are ideally suited for knowledge sharing and can address drawbacks in the traditional KM technologies used within organisations. Indeed, many researchers now feel that Web 2.0 technologies have fundamentally altered the approach to KM and it has undergone a paradigm shift from a static knowledge-warehouse approach to a more dynamic communication-based or network approach (Von Krogh, 2012). He describes the use of Web 2.0 for KM as 'social software-based KM' that is flexible to local circumstances, targeted to users' needs, often designed by users themselves and configured in such a way as to fulfil a particular purpose in social practice.

Bebensee *et al.* (2011) suggest social media are fundamentally disrupting the way employees deal with knowledge. They see many Web 2.0 characteristics overlapping with KM practices and applying Web 2.0 tools to KM as having the potential to improve the sharing and creation of knowledge. In a literature review of the current state of KM, Levy (2013) reports that the main theme in many of the articles is that traditional KM is obsolete and that social media tools are the new means through which organisational knowledge should be shared.

4.0 Social Media and Communities of Practice

The term Communities of Practice (CoP) is relatively new although it is based on concepts of learning and knowledge sharing that are centuries old. Wenger (2011) defines CoP as groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly. Although originally based in learning theory, CoP are now widely accepted as an important KM strategy. Wenger (2004) argues that CoP are the cornerstones of KM because they are social structures that focus on knowledge and explicitly enable the management of that knowledge to be placed in the hands of practitioners. According to Cox (2005), CoP are the classic conceptualisation of

KM as more than information management, as they are a social and not an individual or technological solution, about tacit not codified knowledge.

CoP are largely voluntary entities that grow organically and can exist entirely within a business unit or stretch across divisional boundaries. According to Wenger and Snyder (2000), it is not particularly easy to build and sustain CoP or to integrate them into an organisational structure. They also insist that their nature makes them resistant to supervision and interference and that they cannot be mandated if they are to be successful, but rather the infrastructure and environment for them to thrive must be developed and nurtured. However, other research would suggest that CoP can be intentionally created or mandated (Garavan *et al.*, 2007; Soekijad *et al.*, 2004). In analysing this research, Agrawal and Joshi (2011), conclude that CoP can be intentionally created if appropriate seeding conditions are provided by organisations and Cox (2005) concludes that CoP are relatively informal, intra-organisational groups specifically facilitated by management to increase learning or creativity.

Although the concept of CoP developed largely as groups that physically met with each other, the usefulness of ICT in the development and expansion of CoP cannot be underestimated. In particular, where community or team members are geographically dispersed, ICT has a significant role to play in the facilitation of meeting and knowledge sharing (Gibbs *et al.*, 2012). As social media tools provide many opportunities for the exchange of ideas, information and knowledge (Lewis and Rush, 2013), this technology has particular relevance to CoP and can be used to create what is termed a 'virtual community of practice'. A virtual CoP (vCoP) can be completely online or partially online, with some members meeting face-to-face and then communicating with other remote members online. vCoP in business have been shown to be effective in improving knowledge sharing and reducing professional and structural isolation (Barnett *et al.*, 2012).

Social media also has a considerable role to play in the capture of knowledge so that it can be preserved for future use. Within CoP, social media can help members apply the SECI model which turns the socialisation, externalisation, conversion and integration of knowledge into operationalization (Alberghini et al., 2014). According to Schneckenberg (2009), social media-based corporate platforms support dynamic knowledge exchange, representing the genuine interests and competence domains of employees, leading to the

emergence of corporate information structures through a bottom-up, almost organic approach. This is highlighted as the main difference between Enterprise 2.0 for knowledge exchange and more traditional communication and knowledge management approaches (Schneckenberg, 2009).

5.0 Knowledge Management in Higher Education Contexts

According to Petrides and Nodine (2003), KM in education can be considered as a framework that enables staff within an organisation to develop a set of practices to collect information and share what they know, leading to actions that improve services and outcomes. They describe a KM framework with three core organisational resources: people, processes and technology; where people come together in informal groups (CoP), the processes that lead to more informed decision making are promoted, and all of this is supported by appropriate technologies.

A case study of UK HEIs concluded that KM is still in the process of establishing itself as a new aspect of management and slowly but surely is capturing the attention of HEIs (Cranfield and Taylor, 2008). Kidwell et al. (2000), believe that there is tremendous value to HEIs that develop initiatives to share knowledge to achieve business objectives, arguing that, if done effectively, KM can lead to better decision making capabilities, reduced development cycle time for curriculum and research, improved academic and administrative services and reduced costs. Kidwell et al. (2000) also indicate that the biggest obstacle to implementing KM in HEIs is the organisational culture, which they describe as the beliefs, values, norms and behaviour that are unique to an organisation.

According to Petrides and Nguyen (2007), the introduction of KM into the educational arena from the business sector has been slow with KM practices little used. They attribute this both to the fact that KM has been a systems-oriented process that would require substantial change in business processes, and to the traditionally hierarchical nature of HEIs, with silo-like functions making institute-wide initiatives difficult to implement. According to Fullwood et al. (2013), HEI organisational structures invariably differ from that of most public and commercial institutions. Tippins (2003) describes the unique cultural and bureaucratic practices of HEIs as barriers to KM and Lee (2007) suggests that the sometimes idiosyncratic and complex nature of academic departments can also be problematic in this regard.

Both the organisational structure and the organisational culture of HEIs tend to promote the division of the organisation into tribes or silos. Of course, divides exist in any organisation where different professional groups interact and where professional groups are managed, with individual workers associating with projects, trades, departments or functions, increasing the difficulties associated with knowledge sharing, coordination and interaction between these groups. Shoham and Perry (2009) describe the current structure of most academic institutions as characterised by a loose coupling between its faculty and staff units and Kuo (2009) talks about the sense of disconnection between faculty and staff which makes it difficult for them to work collaboratively. James (2000) states that 'an unusual organisational characteristic of universities is the deeply entrenched division in roles and status between academic and administrative staff'. Santo (2005) argues that the reasons for this entrenchment lie in the fact that two very different knowledge bases are involved and the interpretation of events by faculty and staff is different due to different values and priorities. This situation seems to be exacerbated in the Irish Institute of Technology sector which mirrors the former polytechnic sector in the United Kingdom (known as 'post-1992 universities') where those institutions tend to be more bureaucratic in character than traditional universities, with a centralised and hierarchical management structure where all staff report to line managers and have less autonomy (Fullwood et al., 2013).

In today's fee-paying environment, coupled with the ever diversifying makeup of the student population, it is becoming increasingly important that the quality of the educational experience meets expectations. Service quality has now become a fundamental aspect of educational excellence. Aldridge and Rowley (2001) found that students perceive the quality of an institution's learning environment both in terms of intellectual faculty and appropriate facilities of learning and infrastructure and this perception will decide if their interest in the institution is retained or not. The students are motivated by both the academic and the administrative efficiency of their institution. Malik *et al.* (2010) believe that the quality of service delivery is contributed to through the cooperation of faculty and staff and by the interaction of both groups with students, and Bassnett (2005) states that faculty and staff must work more closely together if this is to be achieved, with a need for a cooperative community based on mutual trust.

The role of organisational culture in KM practices and knowledge sharing in particular has attracted considerable debate in the literature. The recognised corporate cultures of

long-established companies such as Toyota ("the Toyota way") and Hewlett Packard ("the HP way") and newer companies such as Google and Facebook, can be sharply contrasted with the absence of any such universal culture in HEIs, where silos and individualism are dominant. For example, Lee (2007) suggests that faculty are more inclined to show loyalty to their discipline rather than their department and Collinson and Cook (2003) state that is customary for faculty to work in isolation from each other.

This culture is underpinned by, and also perhaps in part caused by, the nature of HEI organisational structures. The governance structure of public HEIs tends to be bureaucratic and complicated with large amounts of committees and sub-committees, mostly a sub-set of an Academic Council or similar body. In general, these groups are highly structured and controlled and may not a conducive arena for knowledge sharing. They tend to meet only three or four times during an academic year and any agreed outcomes can take years to implement. Although representatives from faculty and staff have membership of many of these committees, their unwieldy structures tends to perpetuate the divide between the groups. Sub-committees of an academic council are largely seen as being faculty led and sub-committees of other bodies such as a governing authority may be perceived as being staff led, all of which may enhance the distrust that might exist between faculty and staff.

6.0 Contextual Setting

There are already some examples of informal knowledge sharing activities in HEIs through CoP (Fullwood et al., 2013), and indeed a number of CoP have recently emerged in the contextual setting for this study, and are being actively encouraged and supported by senior management, although instigated by non-management staff members. For the study, it is theorised that CoP can have a positive impact on bridging the gap between silos in HEIs, particularly between faculty and staff, and may have the long-term effect of changing the organisational culture such that a working environment that is conducive to knowledge sharing is stimulated. However, the measurement of any change in organisational culture is beyond the scope of this study.

The contextual setting for the study is Limerick Institute of Technology (LIT) where the researcher has been the IT Manager since 1998. LIT has some 6,500 students and 600 staff, delivering a range of courses from its campuses in the mid-west region of Ireland. This study proposes to introduce a number of social media tools that integrate with LIT's

intranet system which runs on the Microsoft SharePoint™ platform. These tools will be designed to create an environment where knowledge sharing can take place between any member of the organisation, irrespective of discipline, function or grade. Given the multi-campus structure of LIT, with seven sites across a large geographical area, the ICT facilities for CoP to operate and communicate effectively, need to be in place. For CoP to emerge from the bottom-up in the organisation, the virtual environment to facilitate this has to be present if all interested parties are going to have the ability to fully participate.

Some of the social media tools that are being considered include a wiki that could be used to capture and share knowledge and a corporate social media site which could be used to promote informal knowledge sharing amongst staff and stimulate the creation of groups for specific purposes (CoP). From a practitioner perspective, one of the desirable outcomes of the introduction of these tools is the engenderment of a sense of community amongst all staff such that a working environment might be stimulated where CoP become part of the organisational culture. However, as desirable as that outcome might be, the main focus of study from a theoretical perspective is to examine how these social media tools might be successfully integrated in the contextual setting, and to determine their impact on informal knowledge sharing activity. It is important that the tools be implemented for specific tasks initially, such as programmatic review for example, as many KM programmes have failed because the strategic intent was too vague and focused on broad aspirations such as improving communications or developing community and learning (Venters, 2010). A strong vision of the purpose of the tools is required and that vision needs to focus on the work practices of the users rather than on the tools themselves. Further, in order to avoid new tools being perceived as faddish, a perception which leads to their regular stagnation or abandonment, the development of a framework on which the tools can be introduced into the organisation and further developed would be a significant advantage.

7.0 Stages of Growth Models

The first theoretical model for the growth of IT in a business was developed by Richard L. Nolan in the 1970s and originally consisted of four stages but this was expanded to six in 1979. The model proposes that evolution of IT in organisations begins at the *Initiation* stage with little user awareness and an emphasis on functional applications to reduce

costs. This is followed by the *Contagion* stage where there is a proliferation of applications as well as the potential for more problems to arise. During the *Control* stage, centralized controls are put in place and a shift occurs from management of computers to management of data resources. This is followed by the *Integration* of diverse technological solutions and then management of data allows development without increasing IT expenditures in the *Data Administration* stage. Finally, in the *Maturity* stage, high control is exercised by using all the information from the previous stages (Nolan, 1979).

A number of stage models for IT penetration into organisations have been developed from Nolan's model. For example, Damsgaard and Scheepers (2000) introduced a model for measuring the success or failure in the management of intranet technology. The model consists of five stages, from initiation through contagion, control and integration and actions that must take place to avoid stagnation and for the intranet to become 'institutionalised'. Some research has been done on the implementation and management of intranet technologies into organisations, including HEIs (Damsgaard and Scheepers, 2000), (Duane and Finnegan, 2003), (Hustad, 2013), all of which used adaptations of stages of growth models to measure stage growth. However, these were all related to intranets as information portals and did not include applications of social media. More recently, Duane and O' Reilly (2012) have examined using a stages of growth model for managing social media business profiles of organisations. According to Jacobs and Nakata (2010), "the evolution of adoption of social media within a company can be better understood using the stages of growth framework. It can provide a roadmap for improvement, which can help with planning and developing the organisation's information systems strategy".

Venters (2010) argues that a KM tool's success depends on its ability to neither stabilise as a routine and taken for granted technology, nor become abandoned as an unusable technology. It has been traditionally argued that for any technology to be successful, a user's understanding of it must stabilise (Bijker, 1997), effectively becoming a black-box. In terms of SOG models, this typically occurs in the Integration stage, leading to the technology becoming institutionalised. However, the success of social media tools to date has been in their flexibility of use and the ability of the user community to develop new uses for them. This suggests that the successful implementation of social media tools lies somewhere between the stages of Initiation and Integration on a SOG model.

According to Venters (2010), rather than aiming for the stabilisation or longevity of such tools, they should be considered in the moment and will require frequent or constant reinvention. One of the goals of this research is to reflect this in an adapted SOG model.

Figure 1. Stages of growth model (Damsgaard and Scheepers, 2000)
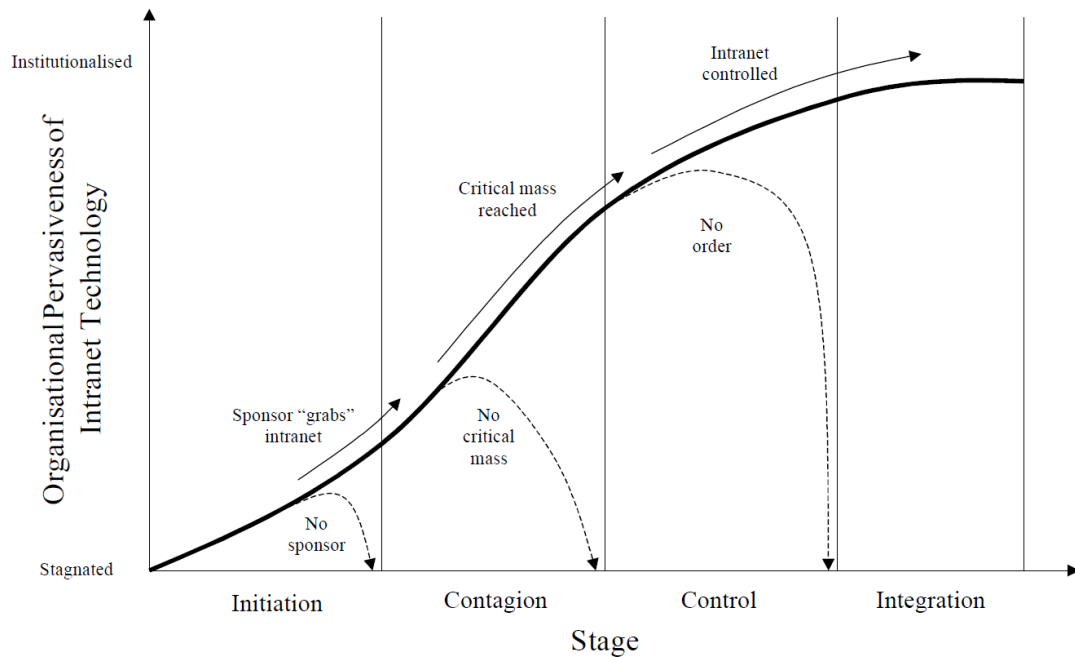
There are other aspects of social media tools that need to be considered in the development of a SOG model, in particular a characteristic that Riemer *et al.* (2009) refer to as 'Nutzungsoffenheit', meaning flexibility in use. They define this as "*a form of openness, whereby the technology and its set of features do not precepitate its forms of usage*". In practice, this means that social software is flexible enough to support current work practices and to allow for new and innovative uses inspired by practice, as opposed to classic information systems which require employees to radically change their work practices, and organisations their business processes in many cases, and this can allow for organic growth and development (Richter *et al.*, 2013).

These challenges notwithstanding, SOG models present a very useful tool in helping to identify the number of stages, the paths of evolution, benchmark variables and the dominant problems experienced by organisations at each stage (Solli-Sæther and Gottschalk, 2010), representing "*a picture of evolution, where the current stage can be understood in terms of history and future*". Although many of the dominant problems associated with the implementation of social media, such as a lack of skills, resources or

strategy, can be determined from the literature, the stages of growth model can also be used to conceptualise these problems, thereby helping to manage their effect, reduce their impact or eliminate them altogether (Duane and O' Reilly, 2012). Their application to the model can be used to determine a series of interventions that can be taken to enable progression from stage to stage along what is termed a "path of evolution", which is the path that the implementation must follow along the stages of growth model towards institutional absorption (Duane and O' Reilly, 2012).

8.0 The Research Approach

The implementation of social media tools within the organisation (the research setting) would be considered as an intervention; an intervention which would be led by the researcher, who would thus have a full participatory role in the research process. The approach to this study will embrace the researcher's place within the study, fully recognizing that a priori knowledge and existing values will invariably intrude upon the observation (Baskerville, 1999). A pragmatist viewpoint recognizes that the researcher will have an effect on the research setting and the analysis as personal prior knowledge and understanding will colour the deductions from the data analysis (Baskerville, 1999). The researcher can either attempt to minimize the effects of this intrusion or embrace it as an integral part of the research process.

From this understanding, it was considered that Action Research (AR) would be the most appropriate research strategy to adopt for the study. Coghlan and Brannick (2014) define AR as an iterative process of inquiry that develops solutions through a participative and collaborative approach, generally having contextual implications beyond the research project. AR involves an intervention by a researcher in a real organisational context with the aim of both improving the context and at the same time gaining relevant knowledge of the intervention. It also assures the active interest of the organisational management and has the advantage of enabling access to situations usually unavailable to other research approaches (Venters, 2010).

In AR case studies, where an intervention takes place, followed by iterative analysis and investigation, it may be necessary to factor in a longitudinal design. Robson (2002) describes longitudinal designs as involving repeated measures on the same variables for the same group(s) over an extended period. Longitudinal studies are essentially used to examine the effects of interventions over time. However, they are difficult and complex

to run and typically require considerable resources. They do, however, provide a good fit with a pragmatic critical realist position as, according to Ruspini (1999), they build a bridge between quantitative and qualitative research traditions and enable a 're-shaping of the concepts of qualitative and quantitative research', with longitudinal studies combining extensive (quantitative) and intensive (qualitative) approaches. Ramachandran et al. (2009) argue that longitudinal case studies may be more useful than cross-sectional studies in examining KM processes in HEIs.

9.0 Conclusion

When compared to many other organisation types, it has been determined that HEIs have unique cultural and structural characteristics that make the use of KM practices in these organisations difficult. Social media tools also have a number of unique characteristics compared to other information systems, particularly with regard to flexibility of use and the ability of the user community to change the way in which they are used. In implementing social media tools in a HEI context, it would appear that SOG models that have been developed for implementation of information systems such as intranets or even social media for other purposes, such as marketing, may not be sufficient for use as frameworks in this context. A contribution to theory of this study would be to develop a SOG model for the purpose of implementing social media tools for knowledge sharing in HEI contexts. This would also have a significant contribution to practice as a successful model could be used by other organisations to manage similar implementations. A further contribution to theory is sought by examining the relationships netween social media and CoP in order to further the understanding of how social media can be used by CoP to stimulate their communities and interactions, particularly in a dispersed organisation such as a multi-campus HEI.

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Paper 2

An Evaluation of Using Social Media Tools for Knowledge Sharing in Higher Education Contexts: Methodology.

Preface

The development of the methodology paper took place between April 2015 and September 2015, when it was presented for external examination at WIT. Further revisions based on examiners' comments were made prior to submitting the final version in January 2016 and this version is presented here.

When I started to write this paper, I was still focussed on a mixed methods approach, with quantitative measurements of use of the social media tools mapped to a SOG model, and measurement of collaboration between discrete groups of faculty and staff. I had a vision of a SOG model as a purely numerical model, that captured the usage of a system as it grew in an organisation. These measurements were to be complemented with qualitative methods to assess any change in organisational culture and the attitudes of different groups towards each other. I had proposed to survey all of the staff in the institute and then to select a sample for interviews. I had also proposed a longitudinal design to the research and this is included in this paper. Some of my reading had suggested that in AR case studies, where an intervention takes place, followed by iterative analysis and investigation, it may be necessary to factor in a longitudinal design. Robson (2002) describes longitudinal designs as involving repeated measures on the same variables for the same group(s) over an extended period, and they are essentially used to examine the effects of interventions over time. Given the nature of the academic year, I felt that it was necessary to extend the data collection into a second academic year. A longitudinal design also provided a good fit with my pragmatic critical realist philosophical position as, according to Ruspini (1999, p.220), they build a bridge between quantitative and qualitative research traditions and enable a "re-shaping of the concepts of qualitative and quantitative research", with longitudinal studies combining extensive (quantitative) and intensive (qualitative) approaches. Ramachandran *et al.* (2009) argue that longitudinal case studies may be more useful than cross-sectional studies in examining KM processes in HEIs. However, longitudinal studies are difficult and complex to run and typically require considerable resources, and the time frame for the DBA ultimately could not facilitate such an approach.

I persevered with the mixed methods approach until the external examination of the paper, when the examiner suggested that I should adopt a purely qualitative approach to the study, largely because the approach that I was proposing was not manageable in the time

frame of the DBA programme. This forced me to change my thinking as I had been convinced that one or even two surveys would provide me with the most useful data set. Although there are many AR studies that used quantitative and mixed methods, AR is a research paradigm that mostly uses qualitative data. According to Bryman (2015), AR is more common in fields such as business and management research, and education and social policy, and the fact that it includes people in the diagnosis of and solutions to problems, may account for largely qualitative approaches. Eventually, I dispensed with the survey strategy and adopted focus groups and semi-structured interviews as the main data collection instruments, supported by ESN content analysis and reflective journaling.

Reflective journaling was a relatively new concept to me and not something that I had ever really done before. We had been encouraged to keep a reflective diary as part of the DBA process and I had been making sporadic entries in that since the start of the DBA. As I embarked on the AR project, I quickly came to realise the value of reflective journaling and it became an indispensable part of my research. I adopted a two stage journaling process which involved capturing a record of situations and conversations in the first instance, and reflecting on them at a later stage. Much of the learning that takes place in AR happens as a result of casual conversations and interactions and it is essential to capture and reflect on these.

The research questions were finalised during the development of this paper. However, I became interested in the view of Maxwell (2008), who maintains that a significant part of the research may need to be done before it is clear what specific research questions it makes sense to try and answer, and cautions against precisely framing research questions too early in the study. This made some sense to me in terms of the AR approach to the study and I believed that the research questions were a starting point and were likely to change somewhat as the study progressed. However, the research questions were used to develop the conceptual model that I developed for empirical testing and this meant that the research questions could not really change over the course of the research, and this ultimately proved to be the case.

The paper discusses some of the practical and ethical considerations of conducting the research. However, these areas were not given due consideration at the time. For example, I mention that an ethical framework for this study had been developed, and included information on how practical details relating to focus groups, interviews, and personal

data were to be handled. My understanding of research ethics, and especially the unique dilemmas that are presented by undertaking AR, was not sufficiently developed to elaborate on this at the time. It was only when I needed to gain ethical approval from both WIT and LIT that I seriously began to consider the ethics, and other related aspects, of AR, and this was helped by my pragmatic philosophical stance. According to Coghlan and Brannick (2014), ethics in the context of research is normally considered in terms of the traditional empirical research paradigms, where researchers typically use subjects to obtain data. Within these paradigms, ethics refers to the basic considerations of not doing harm, maintaining confidentiality and anonymity, and data integrity. However, by following these established ethical principles, the action researcher may find themselves doing what Lee (2001) refers to as "inaction research". Therefore, standard ethical considerations were not going to be sufficient for this project.

According to Mockler (2007), the ethics of AR lies at the congruence of the ethics of practice and the ethics of research, adding additional complexity to already difficult ethical questions. Just as AR itself blurs the line between research and practice, consideration of ethics for AR must also consider both. Mumford (2001, p.20) stresses that an important aspect of beginning an AR project is "to ensure that both the researcher and all contacts in the company have a clear, specific and agreed knowledge of what is to take place", and there should be no ambiguity or uncertainty. Indeed, Groundwater-Smith and Mockler (2007) stress the need for participants to be able to challenge both the observations and the interpretations of the research, and cite this as a basic requirement for AR to comply with quality norms. According to Rowan (2000), performing AR ethically, involves building relationships between the researcher and the research participants, whether they are individuals, groups or communities. In building these relationships, a number of ethical questions arise, mostly due to the understanding that AR is a political enterprise which has consequences for both the researcher and the participants (Williamson and Prosser, 2002). Coghlan (2001) maintains that the goal of action researchers is to generate information from collected data to inform decision making, but such information can be intensely political. Therefore, action researchers have to be politically astute in order to successfully negotiate organisational politics. During the course of an AR project, an organisation's political climate may be exposed, perhaps unintentionally, and power relations may come under scrutiny, with possible consequences for the researcher (Williamson and Prosser, 2002). The insider aspect of

the action researcher working within their own organisation should guarantee an understanding of the organisation's power structure and political culture, and ensure that the researcher can operate in a manner that is in keeping with those conditions without compromising the project or the researcher's position (Coghlan and Brannick, 2014).

As researchers and participants have to work closely together, others in the organisation may know who participated and may be able to identify who said or contributed what, such that the preservation of confidentiality and anonymity may become an issue. The issues of confidentiality and anonymity extend to the research methods being used in the study which, in this case, are focus groups, semi-structured interviews and content analysis. In dealing with focus groups and interviews, participants must be given the opportunity to request that any of their comments be erased from transcripts (Barbour, 2008), and all data gathered using these methods should be completely anonymised before analysis. Content analysis may present other difficulties for the researcher in that informed consent for participation in focus groups and interviews tends to be clearly understood by participants, but this may not be the case with content analysis. According to Rourke *et al.* (2001), informed consent is the biggest ethical issue for content analysis research and may require the researcher to go to great lengths to obtain consent or strip non-participant postings.

An AR project influences change in organisations so, although the informed consent of participants is entirely necessary, it may not be clear as to exactly what they are consenting to. According to Hope (1998), because AR is a journey involving participation, action and reflection, the idea of informed consent is not as meaningful as with other research approaches, as neither the participants or the researcher know where the journey will lead in advance and what actual changes may occur. Meyer (1993) believes that the traditional understanding of informed consent is inadequate for AR, and sees participant cooperation as always forced to some degree, contradicting the ethos of willing collaboration. Kelly (1989) argues that informed consent should be viewed together with other ethical principles, but should not be the overriding one. According to Smith (2008), informed consent should not be a solitary activity at the commencement of a project, but an ongoing and negotiated process throughout the project. Change within an organisation or to people's working conditions may be met with resistance and this may also present the researcher with difficulties. Williamson and Prosser (2002) point to the establishment of an ethical code for action researchers and extensive collaboration so

that participants own the findings as much as the researcher, as ways of addressing these dilemmas. Coghlan and Brannick (2014) highlight the usefulness of journaling in coping with and exploring ethical issues in AR and pay particular attention to the reflective aspect of this practice. This view is supported by Smith (1999), who indicates the significant influence of written reflections on the ethical and methodological rigour of a study.

The development of a mutually acceptable ethical framework involves negotiation between the researcher and the host organisation, but this may be problematic as their goals may differ substantially. The researcher must not lose sight of the fact that they must be of value to the organisation in which the research is based (Baskerville and Wood-Harper, 1998), highlighting the importance of both parties negotiating their goals. According to a number of authors (Wenger and Snyder, 2000; Paroutis and Al Saleh, 2009; Zboralski, 2009; Wang and Noe, 2010; Mosha *et al.*, 2015), management support is a prerequisite for the establishment of a successful knowledge sharing environment, therefore executive management backing for the project must be agreed and attained prior to commencement. For this study, senior management were engaged at an early stage. The background to the project, the planned interventions and the potential participation of individual management personnel were all discussed in detail and approval for the project was achieved at the outset. A satisfactory balance was found between the practical goals of the creation of the knowledge sharing environment, and the theoretical goals of the research in examining the behaviour of staff within the knowledge sharing environment.

According to Baskerville and Wood-Harper (1998), researchers must clearly brief participants concerning the experimental nature of the action taking and the iterative nature of the research process. In seeking the informed consent of participants, issues of confidentiality and anonymity need to be addressed. However, participants must have a very clear understanding of the unique aspects of an AR project that may present difficulties with providing guarantees of confidentiality and anonymity before consenting to participation. For this study, the informed consent of participants was obtained separately for the different data collection instruments, with appropriate information sheets provided for each. The nature of focus groups and semi-structured interviews are somewhat different in their execution, and it is important that participants have an understanding of how these sessions are conducted and data gathered, before agreeing to participate.

Walker and Haslett (2002) suggest that ethical issues in AR should be grounded in the AR cycle itself. Accordingly, ethical questions should be posed around the cyclical activities of diagnosing, action planning, action taking, evaluating and specifying learning. The processes of ensuring confidentiality and anonymity, obtaining consent, and balancing different and conflicting needs, are actualized during these phases. During each phase of the AR cycles, the researcher should examine carefully who will be affected and how they will be affected. The development of a complete ethical framework took considerable effort and time to complete, and was not fully developed by the beginning of the AR project. It also includes specific issues pertaining to the ESN and vCoP and so it is presented in full in the preface to Paper 3 with additional commentary on these aspects.

Abstract

There are many recognised benefits to knowledge sharing between staff in organisations and significant competitive advantage can be gained when staff willingly share their knowledge with each other. This is especially true of knowledge-intensive organisations such as public higher education institutions. However, knowledge sharing amongst staff in these organisations has been shown to be at low levels. Communities of practice is considered to be an effective knowledge management strategy to promote knowledge sharing in organisations and enterprise social networking tools have many similarities to communities of practice that facilitate the growth and development of these communities through their use. The objective of this research is to examine how enterprise social networks can enable staff knowledge sharing in virtual communities of practice in higher education. The study is framed as an action research project and is being conducted in an Irish higher education institution. A stages of growth model is being used to manage the implementation and development of the enterprise social networking tools and a number of qualitative methods, including focus groups, interviews and content analysis are being used to explore the central research themes of the study. A contribution to theory is sought through exploring the relationship between enterprise social networking and communities of practice, and their impact on staff knowledge sharing. The study findings will also provide an opportunity for educationalists to better understand the scope and the impact of employing enterprise social networking platforms for knowledge sharing.

1.0 Introduction

Knowledge management practices are little used by higher education institutions to either manage their intellectual capital as a strategic asset in order to gain competitive advantage in their marketplace, or for knowledge sharing amongst staff in general. Many reasons have been cited for this in the literature, not least cultural and structural arrangements that are contextually unique to these organisations (Conway, 2000; Collinson and Cook, 2003; Cranfield and Taylor, 2008; Fullwood *et al.*, 2013). The systems based approach to knowledge management that characterised its early stages was also a deterrent for higher education and this, combined with a traditional top-down implementation in organisations, led to a demise in knowledge management use in general (Bower *et al.*, 2001; Johannessen *et al.*, 2001). However, the advent of social media, and its

implementation in the corporate arena, known as enterprise social networking (ESN), has given somewhat of a new impetus to knowledge management, largely due to similarities between ESN and a knowledge management technique known as communities of practice (CoP), both of which promote informal groupings and communication (Levy, 2009; Von Krogh, 2012). Social media are computer-mediated tools that allow people to create, share or exchange information, ideas and media in virtual communities and networks (Kaplan and Haenlein, 2010), and the application of these technologies within the workplaces of organisations to facilitate work-related communication and collaboration is referred to as 'enterprise social networks' by Richter and Riemer (2013). CoP are described by Wenger and Snyder (2000) as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements. The combination of these has the potential to help integrate knowledge management practices into higher education institutions; the lack of which is seen as somewhat of a paradox, given the knowledge intensive nature of these organisations (Fullwood *et al.*, 2013).

Using ESN for knowledge management is at an early stage and has some way to go before it gains mainstream acceptance and recognition of its value for the management and sharing of knowledge in organisational settings (Yates and Paquette, 2011). Indeed, this low level of acceptance and recognition might be considered as a barrier to implementation. However, according to Perez (2012), the use of ESN in organisational knowledge management contexts is poised for significant growth, and Harden (2012) concludes from the research literature that workers operating in virtual environments are "the next evolutionary stage of organisations, which could be as transformational as the industrial age". As organisations begin to employ ESN tools, models that can guide and inform the management of the growth of these tools as they evolve are required. Stages of growth (SOG) and maturity models have been widely used in information systems management since the 1970s and considerable knowledge has been established in this field regarding the management of information systems as they evolve and mature (Chan and Swatman, 2004; Solli-Sæther and Gottschalk, 2010). While ESN does present new challenges for organisations, Duane and O'Reilly (2012) propose that there is significant knowledge to be garnered from existing research on information systems SOG models that can be applied to focus, structure and drive future research and management of these ESN.

This research will specifically examine how enterprise social networks can enable staff knowledge sharing in virtual communities of practice (vCoP) in higher education, using a SOG model as a framework for the implementation and management of the ESN tools. The antecedents for staff knowledge sharing will be identified in order to determine what needs to be in place for the implementation of the ESN tools to be successful, and the dominant problems with the implementation will be determined. The perceived benefits of knowledge sharing for both the organisation and for staff members will be derived from the literature and from the data collection and this will help in the determination of the key motivators for adoption. The study will be framed as an action research (AR) project. AR involves the active participation of the researcher and seeks to bring about change within the organisation in which it is conducted. It is an iterative process normally constructed with a longitudinal design to allow time to examine changes as iterations of the research progress (Baum *et al.*, 2006). According to Baskerville and Myers (2004), the goal of AR is to solve existing practical problems while generating scientific knowledge at the same time. It is about creating organisational change and simultaneously studying the process.

The remainder of this paper will describe the research objectives in terms of focus, reasonableness and appropriateness. A discussion on the approach to the research in ontological and epistemological terms is included. The scope of the methods to be used is described and their selection justified whilst acknowledging their limitations. The research units, populations and samples to be used in the study are described and justified along with the approach to be used in gathering the data. Some operational detail about the methods is also provided in terms of how they will be carried out, where, when and on whom. Ethical issues that may arise during the course of the study are highlighted and addressed appropriately.

2.0 Research Objectives

The importance of knowledge sharing to organisational success is highlighted by Liebowitz (2001), who argues that organisations can attain competitive advantages through encouraging and promoting knowledge sharing. According to Swart and Kinnie (2003), the need for knowledge sharing is even more important in knowledge-intensive organisations such as public higher education institutions, and they must share knowledge held by staff if they are to gain the most from their intellectual capital and compete

effectively in an ever expanding global marketplace. Al-Hawamdeh (2003) asserts that the outcome of knowledge sharing is the creation of new knowledge and innovation that will improve organisational performance, and a number of studies have shown that practicing knowledge sharing results in improved organisational effectiveness (Petrash, 1996; Gupta and Govindarajan, 2000; Olivera, 2000). Applying this perspective of knowledge sharing to the higher education community presents a number of questions. If there is so much to be gained in terms of increased competitive advantage in the marketplace, why has knowledge sharing and knowledge management not been a central focus of higher education institutions' business strategies, and why is there such a low level of knowledge sharing amongst staff in higher education institutions?

Although many contributing factors have been established for the lack of knowledge sharing, a simpler explanation may be found in examining the existing knowledge sharing environments in organisations. According to Mládková (2011), workers will only share knowledge to any great extent when "organisations create a convenient environment for cooperation and knowledge sharing and support them with the knowledge they need". In addition to the absence of a convenient means of sharing knowledge with other workers, a lack of predetermined and focused topic groups may also be a factor. Hew and Hara (2007) discuss the role of community in determining whether workers want to share knowledge with one another and Gray (2004) concludes that workers are reluctant to share knowledge when they feel little identification with a community. Considering these factors, the formal objective of this study is:

> "*to examine how enterprise social networks can enable staff knowledge sharing in virtual communities of practice in higher education*".

In academia, faculty can experience significant isolation from colleagues and other staff within the organisation (Collinson and Cook, 2003), and a number of studies indicate that staff in higher education institutions tend to operate as individuals with loyalty to their discipline rather than to the organisation (Cronin, 2001), or at best, work with internal peer groups (Basu and Sengupta, 2007). According to Wenger (1999), CoP within organisations have been identified as a mechanism to facilitate knowledge exchange between individuals by connecting isolated and distributed pockets of expertise. Lee *et al.* (2015) see CoP as offering a way of interacting with a wider range of colleagues, and

vCoP in business have been shown to be effective in improving knowledge sharing and reducing professional and structural isolation (Barnett *et al.*, 2012). CoP are therefore seen as a suitable knowledge management technique to enable knowledge sharing, particularly in the context of a multi-campus environment where staff members from the same departments are dispersed over significant distances.

To facilitate the introduction and development of CoP within the organisation, the use of ESN is seen as a key enabler. According to Annabi and McGann (2013), the use of ESN in CoP has "tremendous strategic potential, as they inherently emphasise strong relationships, encourage social interactions and promote streamlined, widespread communication between community members". ESN tools can offer improvements to the manner in which CoP function and can increase the level of real-time collaboration across organisations (Annabi and McGann, 2013). According to Hoffman (2009), social networks can be useful mechanisms for creating communities, and are able to support social learning. A combination of these ESN applications can create an effective and convenient environment for communication and learning and can help to build community through dialogue and conversation (Gunawardena *et al.*, 2009).

A number of specific research questions are emerging from the research design and these initial questions will be used to frame the study and influence decisions about methods. They are seen as the basis for further focusing and development of more specific questions as the research progresses, following the proposal by Maxwell (2008), that "models of design that place the formulation of research questions at the beginning of the design process, and that see these questions as determining the other aspects of the design, don't do justice to the interactive and inductive nature of qualitative research". Maxwell (2008) also states that a significant part of the research may need to be done before it is clear what specific research questions it makes sense to try and answer, and cautions against precisely framing research questions too early in the study. Considering this perspective, the following research questions are seen as a starting point and are likely to change somewhat as the study progresses.

RQ1: What are the antecedents for staff knowledge sharing?

The purpose of this research question is to determine what needs to be in place for the successful implementation of ESN tools such that knowledge sharing will take place in vCoP. The antecedents will be determined from the literature (De Long and Fahey, 2000;

Brown and Duguid, 2001; Chiu *et al.*, 2006; Lin, 2007; Usoro *et al.*, 2007; Zboralski, 2009; Wang and Noe, 2010) and from the data collection and much of the analysis will focus on whether the existence of a convenient environment for knowledge sharing and the presence of relevant communities are antecedents for staff knowledge sharing in higher education.

RQ2: What are the dominant problems associated with the implementation of ESN and participation in vCoP?

A review of the literature indicates that there are a number of barriers that inhibit knowledge sharing in higher education institutions, such as organisational, culture, organisational structure, divide and mistrust between staff groups, functional isolation of staff, and staff operating in silos (Garcia *et al.*, 2011; Moran *et al.*, 2011; Davis III *et al.*, 2012; Ranieri *et al.*, 2012; Fullwood *et al.*, 2013). The purpose of this research question is to use the prior theory as a basis to determine the dominant problems associated with the implementation of ESN and participation in vCoP.

RQ3: What are the perceived benefits of knowledge sharing for both the organisation and for staff members?

The literature suggests that increased knowledge sharing amongst staff in higher education institutions has a number of organisational benefits, such as, increased intellectual capital and competitive advantage, increased quality of administrative and support services, and faster curriculum revision and updating (Seonghee and Boryung, 2008; Sohail and Daud, 2009; Roblyer *et al.*, 2010; Sulisworo, 2012). For staff members, a number of perceived benefits can also be garnered from the literature, such as an increased sense of group identity, increased commitment to the organisation, and greater interaction with co-workers, resulting in reduced isolation (Tippins, 2003; Davis III *et al.*, 2012; Fullwood *et al.*, 2013). The purpose of this research question is to determine empirical measures to evaluate a number of perceived benefits and to link the organisational benefits to organisational strategic objectives.

RQ4: What are the key motivators for staff to adopt the use of ESN and participate in vCoP?

Although there are a number of key motivators for knowledge sharing presented in the literature (Ardichvili *et al.*, 2003; Chiu *et al.*, 2006; Sohail and Daud, 2009; Roblyer *et*

al., 2010), many of which are linked to the perceived benefits of knowledge sharing, this research question will us the existing theory as a lens to focus on the convenience of ESN and the existence of predetermined and focused communities for sharing knowledge.

3.0 The Research Approach

The proposed research approach stems from the development of a pragmatic critical realist perspective. In its attempt to describe an interface between the natural and social worlds, critical realism seems to find a practical middle ground between positivism and relativism and would appear to be a good philosophical perspective for conducting business and management research (Bhaskar, 2009). In the debate between the positivist and relativist viewpoints, other alternatives have emerged such as pragmatism, which is a rejection of the idea that the function of thought is to describe, represent, or mirror reality - rather it is an instrument for prediction, action and problem solving. Hughes and Sharrock (1997) state that pragmatists are not worried about ontology or epistemology but rather about the particular problems they confront in their theories and investigations, using appropriate methods for the problems at hand. Both Kelemen and Rumens (2008) and Saunders *et al.* (2011) take a softer view of pragmatism, arguing that rather than completely dismissing ontological and epistemological concerns, pragmatists can work from different philosophical positions, where one might be more appropriate than the other for answering a particular question. The pragmatist's approach to using a method, or methods, that enable credible, well-rounded, reliable and relevant data to be collected (Kelemen and Rumens, 2008), can be viewed as an intermediate philosophical position, one from which multiple methods can be employed in the research, both quantitative and qualitative, allowing for the cross-checking or triangulation of results (Holden and Lynch, 2004). Robson (2002) suggests that there is compatibility between pragmatism and critical realism and that the fundamental values of quantitative and qualitative researchers are really highly compatible when looked at from those perspectives.

The pragmatist stance being taken for this study will inform a mixed methods approach to the research. The study requires the collection and analysis of data on a number of quantitative metrics, which are necessary for the development of the SOG model. A number of metrics are also being developed from content analysis of the data from community postings to determine levels and quality of staff engagement. Although these quantitative findings are necessary to underpin the study, the central research questions

will be addressed through qualitative data collection and analysis, stemming from focus groups, semi-structured interviews and content analysis. However, it is still necessary to frame the study in a plan of action or a strategy. A pragmatist viewpoint recognizes that the researcher will have an effect on the research setting, and the analysis as personal prior knowledge and understanding will colour the deductions from the data analysis (Baskerville, 1999). The researcher can either attempt to minimize the effects of this intrusion or embrace it as an integral part of the research process. The implementation of ESN tools in this study can be considered as an intervention. This intervention will be led by the researcher who will therefore have a full participatory role in the research process. The approach to this study will embrace the researcher's place within it, fully recognizing that a priori knowledge and existing values will invariably intrude upon the observation (Baskerville, 1999). This is supported by Walsham (2006), who regards AR as the ideal way to perform involved research, where the researcher has direct involvement in the change action in an organisation, and it is from this understanding that AR is considered to be the most appropriate research strategy to adopt for the study. Furthermore, while AR involves an intervention by a researcher in an organisation with the aim of improving the context and gaining relevant knowledge of the intervention, according to Venters (2010), it also assures the active interest of management and has the advantage of enabling access to situations usually unavailable to other research approaches.

Coghlan and Brannick (2014) define AR as an iterative process of inquiry that develops solutions through a participative and collaborative approach, generally having contextual implications beyond the research project. Reason and Bradbury (2001) explain that the primary purpose of AR is to produce practical knowledge that is useful to people in the everyday conduct of their lives, and is a process involving people and social situations that has the ultimate aim of changing an existing situation for the better. Koshy *et al.* (2010) claim that AR is an approach commonly used for improving conditions and practices in a range of environments, which involves practitioners conducting systematic enquiries in order to help them improve their own practices, which in turn can enhance the working environment. The purpose of undertaking AR is to bring about change in specific contexts (Parkin, 2009) and this view is reinforced by Meyer (2000), who maintains that the strength of AR lies in its focus on generating solutions to practical problems and its ability to empower practitioners by getting them to engage with both the research process and the resultant development or implementation activities.

The concept of AR was first introduced by Lewin (1946), describing it as "a comparative research on the conditions and effects of various forms of social action and research leading to social action" using "a spiral of steps, each of which is composed of a circle of planning, action and fact-finding about the result of the action". According to Coghlan and Brannick (2014), there have been many adaptations and variants of the original model across a number of fields of study since its inception. However, the main steps remain essentially the same, beginning with diagnosing or defining the issue, usually from combining theory with an engagement with the organisational situation. This is followed by planning action which focuses on determining an intervention or a number of interventions. The next step involves taking action in which the interventions are made. The outcomes of the action are analysed and reflected upon in order to determine if the initial diagnosis was correct, and if the intervention was properly designed and implemented. This feeds into the next cycle of diagnosing, planning and acting (Coghlan and Brannick, 2014).

Figure 1. Adapted from Lewin's AR Model (Lewin, 1946)
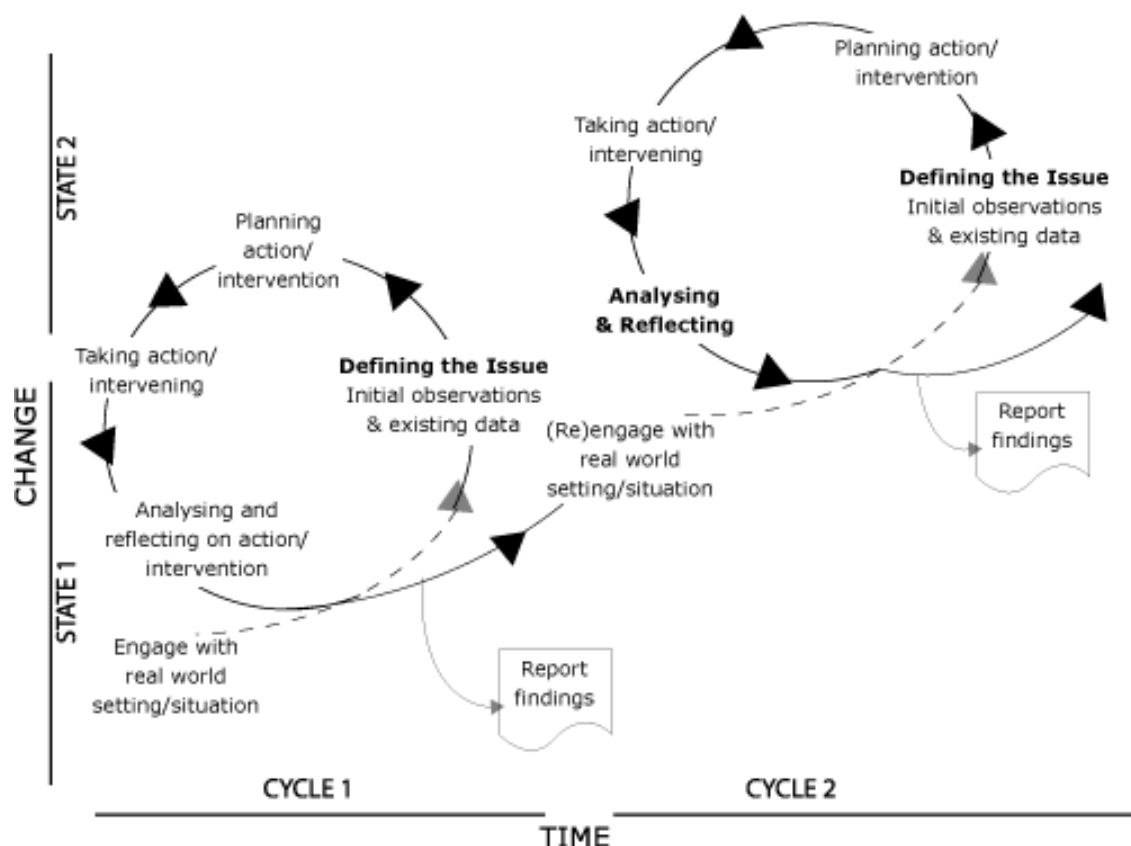
Action researchers work on the assumption that the purpose of research is not just to describe and understand the world but also to change it (Reason and Torbert, 2001), which

would seem to place AR firmly in a radical change context. However, it is increasingly being aligned with a pragmatic critical realist paradigm, with a subjectivist epistemology and an objectivist ontology (Johnson and Duberley, 2000; Coghlan and Brannick, 2014). Knowledge comes from doing and Reason and Bradbury (2001) state that 'AR must draw power from the premises of pragmatism, that belief that we can do through knowing'. Baskerville and Myers (2004) further suggest that the underlying philosophy shared by most forms of AR is pragmatism. Brydon-Miller *et al.* (2003) maintain that AR challenges the claims of a positivistic view of knowledge which insists that research must remain objective and value-free. They favour the notion of knowledge as being socially constructed and that all research is embedded within a system of values which promotes some model of human interaction. AR also goes beyond the notion that theory informs practice, to a recognition that theory can and should be generated through practice (Brydon-Miller *et al.*, 2003).

In AR case studies, where an intervention takes place, followed by iterative analysis and investigation, it may be necessary to factor in a longitudinal design. Robson (2002) describes longitudinal designs as involving repeated measures on the same variables for the same group(s) over an extended period. Longitudinal studies are essentially used to examine the effects of interventions over time. However, they are difficult and complex to run and typically require considerable resources. They do, however, provide a good fit with a pragmatic critical realist position as, according to Ruspini (1999), they build a bridge between quantitative and qualitative research traditions and enable a 're-shaping of the concepts of qualitative and quantitative research', with longitudinal studies combining extensive (quantitative) and intensive (qualitative) approaches. Ramachandran *et al.* (2009) argue that longitudinal case studies may be more useful than cross-sectional studies in examining knowledge management processes in higher education institutions.

4.0 Research Design and Methods

The case site for the study is Limerick Institute of Technology (LIT)[4], one of thirteen institutes of technology in Ireland[5]. LIT is a higher education institution and has 6,500 students and 500 staff, delivering a range of degree courses from its campuses in the mid-

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[4] See www.lit.ie for further information on Limerick Institute of Technology.
[5] See www.ioti.ie for further information on the Institute of Technology sector in Ireland.

west region of Ireland. The practical implementation of the study involves the creation of a Communities Portal and the use of ESN tools to facilitate the establishment and operation of vCoP. The portal will act as a collection point for all of the CoP in the organisation, and will allow users to see what communities are active, join communities or create new ones. It will be integrated with the Institute's existing intranet and communication systems. The primary ESN tool behind the portal is Microsoft's Yammer, which is essentially a social network that's entirely focused on a business. It facilitates group conversation and collaboration and has many similarities to familiar social media tools such as Facebook and Twitter. The addition of further enterprise social network tools, such as wikis and blogs, will be considered as the project progresses. A mock-up of the Communities Portal is shown in Figure 2.

Figure 2. LIT Communities Portal mock-up

Prior to the commencement of the AR study, a number of preparatory steps must be undertaken. A detailed proposal was submitted to LIT management for approval, describing the social networking tools and how they might be used by staff. This included an outline of the research objectives of the study and listed some of the expected benefits

to the organisation, which were be drawn from the literature[6]. The creation of the Communities Portal and the integration of the enterprise social network involves considerable design and technical work and this is being undertaken by the Computer Services Department in LIT. The Communities Portal will be launched with a number of pre-mandated CoP, each of which will have a designated leader or moderator. Some of these were suggested by LIT management and, in addition, an information email about the project was issued to all staff at LIT[7], with a view towards establishing interest in further communities. As a result of this, the Portal will be launched with at least 15 pre-mandated CoP, which can be seen in Table 1.

Table 1. CoP initially included in LIT Communities Portal

Computer Networks	Web Analytics	STEM Marketing
Interior Design	Office 365	STEM Maths Teaching
Research Methods	Blended Classroom	Campus Development & Planning
Health & Wellness	Pedagogical Skills	Sports
Moodle Users	Enterprise & Innovation	Technology Enhanced Learning

The simple existence of the Communities Portal within the corporate network does not offer any guarantee of use of the ESN and the vCoP. Indeed, some early use may be recorded in-line with the diffusion of innovations theory (Rogers, 1995), with innovators and early adopters trying out the tools as they discover them. However, for the tools to become embedded in the organisation and their use sustained, a critical mass of users must be achieved. For this to happen, a series of interventions will be required, and each of these interventions will mark an iteration of the AR project, where the effect of the intervention will be measured empirically and reflected upon before embarking on further interventions and iterations of the research cycle. For a breakdown of the AR stages, planned interventions and anticipated outcomes, see Table 2. The first stage of the AR cycle involves the management launch of the LIT Communities Portal with the CoP described in Table 1. This stage will also involve training in how CoP operate and use of the ESN tools. The second stage will involve an awareness campaign which will include emails to all staff, and advertising on Staff Portals and other media, in order to attract requests for the creation of additional communities. Following this, a second wave of

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[6] See Appendix 1
[7] See Appendix 2

communities will be launched on the Portal. The third stage involves the integration of additional ESN tools such as wikis and blogs, in order to enhance to usability and effectiveness of the system. Training will also be provided to users on these tools to encourage their use.

Table 2. AR Stages with Planned Interventions and Anticipated Outcomes

AR Stage	Planned Intervention	Anticipated Outcome
1	Launch of LIT Communities Portal with executive management backing. The Portal will have pre-mandated communities as outlined in Table 1.	Initial participation in the communities by members who have been included in the setup. Requests by additional staff members to join communities.
1	Training in CoP and the full use of the ESN tools.	Increase in level of engagement and quality of engagement by community members.
2	Awareness campaign, through email, advertising on Staff Portal and newsletters.	Further increase in level of engagement and requests from staff for the addition of further CoP.
2	Launch of second wave of communities.	Increased number of users.
3	Integration of additional ESN tools such as wikis, blogs, discussion forums, RSS feeds.	Increased level of use, beginning with innovators and early adaptors.
3	Training on use of new tools.	Use of the ESN reaching a sustainable level of usage.

A period of reflection is required at the end of each AR cycle and before the next intervention takes place. To facilitate this process, a reflective journal will be kept throughout the course of the AR project. It will be used to focus thoughts and develop ideas, experiment with ideas and ask questions, organise thinking through exploring and mapping complex issues, and reflect on what worked and why, and what did not work and why, during each AR cycle. Coghlan and Brannick (2014) describe journal writing as a useful means of developing reflective practice and "an important mechanism for learning to reflect on and gain insights", which can help to identify gaps between the

explicit and tacit knowledge of the researcher. According to Moon (1999), keeping a journal helps the researcher to reflect on experiences which helps to anticipate future experiences during the AR cycles. McNiff and Whitehead (2009) describe some of the useful functions of keeping a diary, including using it as an analytic tool where data can be recorded and examined, and using it as a reflective tool where the researcher can "tease out interpretations".

The establishment of pre-mandated CoP is considered to be of particular importance as many knowledge management programmes have failed because the strategic intent was too vague and focused on broad aspirations such as improving communications or developing community and learning (Venters, 2010). A strong vision of the purpose of the tools is required and that vision needs to focus on the work practices of the users rather than on the tools themselves. To achieve this, considerable emphasis will be placed on developing users' understanding of what the CoP are about rather than solely focusing training efforts on the ESN tools themselves. Furthermore, to avoid new tools being perceived as faddish which can lead to their regular abandonment, the development of a framework on which the tools can be introduced into the organisation and further developed would be a significant advantage. To this end, it is proposed to use an adapted SOG model for the implementation of the tools.

Solli-Sæther and Gottschalk (2010) conducted a comprehensive review of SOG models and concluded that researchers have long struggled to develop models that are both theoretically founded and empirically validated. This led to the development of a five step modeling process, representing a research procedure to improve theory building and empirical validation during the development of models. The five stages move from a suggested stage model through conceptual and stage models, to an empirical stage model, and finally to a revised stage model, as shown in Figure 3 (Solli-Sæther and Gottschalk, 2010). This study proposes to adopt the Solli-Sæther and Gottschalk (2010) modeling process for SOG models in order to develop a model for implementing and managing the ESN tools in LIT. Each of the planned interventions outlined in Table 2 will mark a growth stage for the system and will be mapped to a stage on the suggested stage model.

The development of the conceptual stage model involves identifying the dominant problems associated with each, and these will be identified by reviewing the literature both on enterprise social network use and knowledge sharing in organisations. For the

theoretical stage model, it is necessary to identify benchmark variables. These are variables that can be empirically tested to measure growth from stage to stage and are derived from theory and from focus groups that will be held in conjunction with training for communities. The empirical stage model requires each variable to be assigned a benchmark value for each stage which can be tested for correspondence with the conceptual values developed with the conceptual stage model. Finally, the stage model is revised based on the empirical tests from research. There are four key topics that are required to theorise and analyse the model: the number of stages; the paths of evolution, which show a pattern of development from stage to stage; the dominant problems, and the benchmark variables (Solli-Sæther and Gottschalk, 2010).

Figure 3: Procedure for the stage modeling process (Solli-Sæther and Gottschalk, 2010).
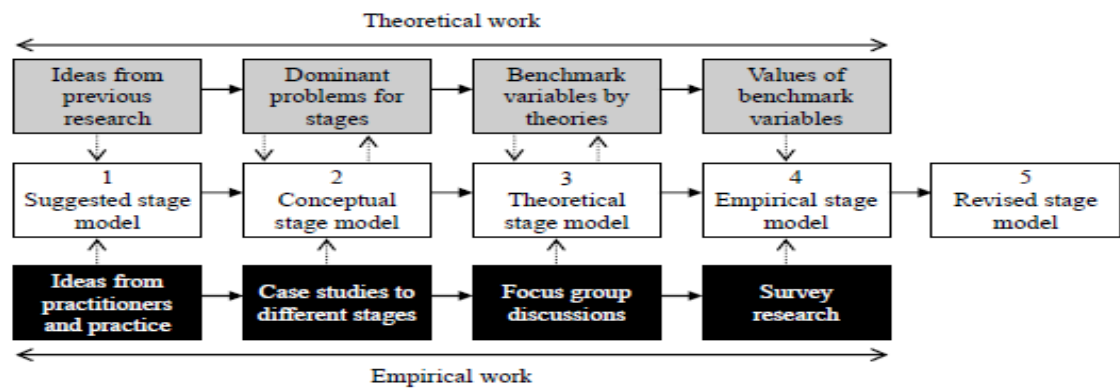
The SOG model will be used as a tool to develop the interventions and iterations required for the implementation and management of the ESN tools and to record and measure growth between interventions and stages. The levels of use of the tools can be measured by using the reporting tools that are available with the systems. The number of users, number and frequency of posts, number of likes, number of articles created, number of edits, etc., can all be determined from the analytical tools. Further quantitative measurements will be derived from content analysis of the postings on the enterprise social network. This anlaysis will help to determine the benchmark variables and the dominant problems for the SOG model.

A number of research methods will be used to specifically address each of the research questions by exploring the relationship between the ESN tools and vCoP, and the engagement of staff in knowledge sharing activity. The application of the research methods to the stages of the AR project is given in the AR Plan (see Table 4). Focus groups will be used initially to determine participants' perceptions, opinions, beliefs, and

attitudes towards a number of topics which are outlined in Table 3. A focus group is a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs, and attitudes towards concepts, products, services or ideas. These groups are interactive where members are free to talk openly with other group members and discussions are of an informal nature (Nili *et al.*, 2014). Although they are not as widely used as other qualitative research methods such as interviews, focus groups are popular in information systems research because they can help to achieve a common understanding between individuals in a group (Sutton and Arnold, 2013). Focus groups can provide useful data that would not be obtainable through individual interviews as participants have the freedom to discuss their ideas collectively, and it is seen to be a fast and economical method of obtaining rich data (Krueger and Casey, 2000).

The data derived from the focus groups will be analysed using the Nvivo software application which will involve coding the data to identify emergent themes and patterns which can be compared to theory, and then used to formulate questions for the next stage of the data collection process – interviews. Semi-structured interviews with staff members will be conducted and the interview data will be analysed using the Nvivo software application. According to Myers and Newman (2007), the qualitative interview is the most common and one of the most important data gathering tools in all kinds of qualitative research, whether positivist, interpretive or critical; it is used in case studies, in AR, in grounded theory studies, and in ethnographies. For the purposes of this research, structured interviews were rejected because they could minimise the opportunity for variability and development of discussion. Unstructured interviews were rejected because they would be too open ended, which would not be helpful in answering the research questions. A semi-structured interview approach is therefore proposed, so that the same questions will be asked of all interview subjects, but with some flexibility to develop lines of enquiry that might be particularly relevant to exploring emergent themes.

The purpose of these interviews will be to collect more detailed data on attitudes towards knowledge sharing, participating in CoP and using ESN tools. The sampling method employed for the target population (LIT staff) will be stratified sampling, where a deliberate effort will be made to make the sample representative of the target population. Subcategories will be based on community members, non-users, and staff categories of faculty, administration and support staff, and management.

In addition to the data gathered from the interviews, it is proposed to conduct content analysis on the postings in the ESN tools. This analysis can be used to examine the relationships between the enterprise social network and vCoP where the main themes and patterns in the conversations and postings can be determined and examined for relevance to the communities. In particular, interest and activity in communities can be evaluated using this method (McLure and Faraj, 2000). This will involve coding the data and, in order to determine which concepts are most cited throughout the data, the frequency of each code will be counted.

Table 3: Focus group and interview topics for research themes

Research Theme	Focus Group and Interview Topics
Knowledge Sharing	Current levels
	Willingness and desire to share knowledge
	Perceived barriers to sharing knowledge
	Perceived advantages of sharing knowledge
Communities of Practice	Awareness of concepts
	Awareness and examples of existing communities
	Perceived usefulness of communities
Enterprise Social Networks	Usefulness of enterprise social networks
	Trust and security issues
	Barriers to using enterprise social networks

Leech and Onwuegbuzie (2008), describe this method as *Classical Content Analysis*, a standard method that has traditionally been used in sociology, journalism, political science and social psychology (Tesch, 1990). The method is similar to constant comparison analysis but instead of grouping the codes together, the researcher counts the frequency of use of each code. More simply known as content analysis, the method enables the researcher to include large amounts of textual information and systematically identify its properties, such as the frequencies of most used keywords by locating the more important structures of its communication content. According to Stemler (2001), content analysis enables researchers to sift through large volumes of data with relative ease in a systematic fashion, and is also useful for examining trends and patterns in documents. Content analysis has also been described as a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules

of coding (Berelson, 1952; Krippendorff, 2012). As content analysis is largely concerned with data reduction in order to identify trends and patterns in documents, it fits in with Patton's belief that qualitative data analysis from the beginning depends on astute pattern recognition (Patton, 1999). Miles and Huberman (1984) also discuss the concepts of noting patterns and themes as a valid conclusion-drawing tactic in qualitative data analysis.

5.0 Practical and Ethical Considerations

AR involves interventions into real life contexts which are aimed at both improving the contexts and simultaneously providing relevant knowledge. It is based on the principle that achieving improvements requires involvement, co-operation and information exchange with organisational members, which leads to a deeper understanding of the context. The process of defining the research must therefore be a negotiated process, requiring an understanding of research and the organisation. The practical aspects of undertaking the research also require careful consideration and, in particular what Mumford (2001) refers to as the "getting in", "staying in" and "getting out" of the research situation. In this case, excessive negotiation to undertake the study will not be required as the host organisation is sponsoring the research.

According to Mumford (2001), an important aspect of beginning the AR is "to ensure that both the researcher and all contacts in the company have a clear, specific and agreed knowledge of what is to take place", and there should be no ambiguity or uncertainty. A formal plan has been created that outlines the nature of the project and specifies the objectives, processes and anticipated outputs[8]. This document has been signed by relevant management personnel, and will be available to all interested parties. Although what actually happens in the project may deviate from what is written in the document and final outcomes may differ from predicted ones, the existence of a starting document will make it easier to examine why changes have occurred and the reasons for these.

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[8] See Appendix 5

Table 4 – Action Research Plan

AR Stage	Intervention	Timeline	Data Collection	Resources	Evaluation
1	Launch of LIT Communities Portal and CoP (see Table 1) with executive management backing.	February 2016	Usage metrics from analytical tools. Content Analysis.	ESN analytical tools. (Microsoft Yammer and Delve).	Apply metrics to SOG model to chart changes in ESN use. Analyse content to determine health of CoP.
	Training in CoP and the full use of the ESN tools.	February to May 2016	Usage metrics from analytical tools. Focus Groups. Content Analysis.	ESN analytical tools. (Microsoft Yammer and Delve). Nvivo Software.	Development of SOG model. Analysis of focus group data to address RQs.
2	Awareness campaign, through email, advertising on Staff Portal and newsletters.	May to October 2016	Usage metrics from analytical tools. Semi-structured Interviews. Content Analysis.	ESN analytical tools. (Microsoft Yammer and Delve). Nvivo Software.	Development of SOG model. Analysis of interview data to address RQs.
	Launch of second wave of communities.	October 2016	Usage metrics from analytical tools. Semi-structured Interviews. Content Analysis.	ESN analytical tools. (Microsoft Yammer and Delve). Nvivo Software.	Development of SOG model. Analysis of interview data to address RQs.
3	Integration of additional ESN tools such as wikis, blogs, discussion forums, RSS feeds.	November 2016	Usage metrics from analytical tools. Semi-structured Interviews. Content Analysis.	ESN analytical tools. (Microsoft Yammer and Delve). Nvivo Software.	Development of SOG model. Analysis of interview data to address RQs.
	Training on use of new tools.	November 2016 to February 2017.	Usage metrics from analytical tools. Semi-structured Interviews. Content Analysis	ESN analytical tools. (Microsoft Yammer and Delve). Nvivo Software.	Completion of SOG model. Analysis of interview data to address RQs.

There are certain aspects of the project and the methods used that require careful ethical consideration. Rapoport (1970) identified ethical issues arising from the researcher's personal over-involvement with the research as one of the main dilemmas with AR and places particular emphasis on the development of a mutually acceptable ethical framework. According to Koshy *et al.* (2010), following strict guidelines on ethical issues is of particular importance for action researchers because of the small-scale nature of the projects located within the working situations of the researcher and special care needs to be taken both for data collection and the dissemination of findings as it would be easy to recognise people and events within local situations. Loewenson *et al.* (2014) stress the importance of evaluating ethical matters that may affect all those involved in order to develop an agreed set of procedures and principles that meet legal and ethical standards. An ethical framework for this study has been developed and includes information on how practical details relating to focus groups, interviews, and personal data will be handled[9]. Submissions have also been made to both the LIT and WIT Research Ethics Committees for approval.

In inviting staff members to join vCoP, it will be stressed that participation is completely voluntary and participants are free to end their involvement in such groups at any time. The rationale for the research will be fully explained to all participants and they will be offered a copy of the final results and report. Focus group and interview data will be anonymised before analysis and no personal data from focus groups or interviews will be included in the findings or final report. Similarly, all content analysis will only take place after personal data has been removed from the content, again ensuring that sources are kept anonymous.

An additional problem of AR proposed by Rapoport (1970), is that the researcher can be faced with a goal dilemma - that is how to manage the practical expectations of the project with gaining sufficient research outcomes. The researcher must remain mindful that the research aims will be achieved, will also delivering on the practical improvements to practice that the project sets out to deliver. Because of the participation of the researcher, AR is sometimes criticised in terms of what Baskerville and Wood-Harper (1998) refer to as "consulting masquerading as research". Care must be exercised by the researcher to ensure that the research remains rigorous and this will be achieved in this study by

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[9] See Appendix 3

detailed documentation of methods, interactions, observations and the maintenance of the reflective diary throughout the project. According to Greenwood and Levin (2006), AR is essentially a balancing act between three elements: research, participation and action, and this study aims to ensure that a balance is achieved between these elements.

In terms of the use of the ESN tools, it is important that the systems are supported by an acceptable use policy to mitigate against any inappropriate or unsecure behaviour by users which may put the organisation in danger of financial losses, reputational damage or litigation, and staff themselves in danger of disciplinary action or prosecution. According to Doherty *et al.* (2011), this is of particularly importance for knowledge-intensive organisations, such as higher education institutions, and advocate the use of formal acceptable use policies (AUP) as a mechanism to reduce inappropriate behaviours. An LIT Enterprise Social Networks Acceptable Use Policy has been drafted for this project[10] and will be incorporated into existing LIT AUPs.

6.0 Conclusions and Limitations

The objective of this research is to examine how ESN can enable staff knowledge sharing in vCoP in a higher education institution. A practical aspect of the study involves the introduction of selected enterprise social network tools, and it is framed in an AR project. The use and development of these tools will be managed through a SOG model which will be adapted from existing models and processes. A contribution to theory is sought through examining the relationship between ESN and vCoP, and staff knowledge sharing. The study findings will also provide an opportunity for educationalists to better understand the scope and the impact of employing enterprise social network platforms for knowledge sharing.

AR itself is a demanding strategy in terms of the intensity involved and the resources and time required (Reason and Bradbury, 2001). The potential for possible researcher bias in data gathering and analysis and how this might lead to difficulties in maintaining rigour in data gathering and critique must also be considered. According to Mumford (2001), AR may also produce results which are not generalizable. To overcome these limitations, an action researcher must be committed to rigorous examination and critique of their practice, and the reflective journal will be used extensively to help with this.

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[10] See Appendix 4

This research study is being conducted in a higher education institution. As it involves a study with a longitudinal design, the structure of the academic year in the organisation may prove problematic in acquiring sufficient data for the research. Academic staff in the IoT sector are generally unavailable from June to September each year and have additional pressures of exam preparation and correction at the beginning and end of the academic year. It is envisaged that one academic year would be insufficient for development of any meaningful models and it is proposed to extend the data collection into a second academic year. The technologies being examined are subject to rapid change and will likely be subject to upgrades, alterations and changes in functionality during the course of the study. Additional factors, such as how the technologies are used (e.g. increased mobile use) may also influence the outcome of the project. However, any such variations will be accounted for in the stage modelling process and ultimately included in the revised stage model (Solli-Sæther and Gottschalk, 2010).

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Appendix 1: LIT Research Proposal

Research Proposal

How can enterprise social networks enable staff knowledge sharing in virtual communities of practice in higher education?

Background

There has been considerable research into the lack of knowledge sharing amongst staff in higher education institutions (HEIs) and knowledge management practices have not been widely employed in these organisations. A number of barriers to organisational knowledge sharing in HEIs have been identified in the literature and these include organisational structures, organisational culture, the bureaucratic nature of most HEIs, and a divide and mistrust between academic and administration/support staff. Given that the collective intellectual capital of any organisation is its primary asset and can increase its competitive advantage, this lack of knowledge sharing is seen as a significant impediment to HEIs competing in their marketplace. According to some authors, the speed of curriculum revision and updating, and quality of administrative and support services are particularly impacted.

Knowledge management practices themselves have had varied levels of popularity in organisations and the use of traditional information technology systems for knowledge capture and sharing has had limited success and unsustained use in many cases. The emergence of social media tools and their application in the corporate arena (enterprise social networking) has given somewhat of a new impetus to knowledge management as some of these tools bear many characteristics of a knowledge management technique known as communities of practice. Communities of practice are described as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements. They generally emerge from the bottom-up but can also be mandated by management in certain situations. In multi-site organisations with significant geographical dispersion, information technology tools play a significant role in facilitating virtual communities of practice, where members may

only occasionally meet in person and most of the community's interaction takes place online.

Project

The project involves the creation of an LIT Communities Portal and the use of enterprise social networking tools to facilitate the establishment and operation of virtual communities of practice. The portal will act as a collection point for all of the communities of practice in the organisation, and will allow users to see what communities are active, join communities or create new ones. A mock-up of the communities' portal is shown below.

The primary enterprise social networking tool behind the portal will be Microsoft's Yammer. Yammer is essentially a social network that's entirely focused on a business. In order to join a business's Yammer network, an applicant must have a working email address from the company's domain. External networks can also be created to allow non-employees, such as suppliers and customers, to communicate with a company. It facilitates group conversation and collaboration and has many similarities to familiar social media tools such as Facebook and Twitter. Other enterprise social network tools, such as wikis and blogs, will be considered as the project progresses.

It is intended to launch the portal with a number of mandated communities. Potential community members will be identified and invited to participate and a community leader will be assigned to each community. A number of potential communities have already been identified as per the table below, but there are endless possibilities for communities.

Community	Possible Members
Campus Planning	Campus development committee; faculty; support staff (e.g. CSD, Estates).
Sports	Sports office; faculty from sport's programmes in Limerick and Thurles.
Learning Needs	Learning support groups; faculty; administration/support staff.
Computer Networks	Faculty from IT department; technical staff from CSD; Network lab users.
Interior Design	Faculty and support staff from Built Environment and School of Art & Design.

Research

The objective of the research has led to the formulation of a number of research questions and a number of different data collection and analytical methods will be employed. The antecedents for staff knowledge sharing will be identified in order to determine what needs to be in place for the implementation to be successful, and the dominant problems with the implementation will be determined. The perceived benefits of knowledge sharing for both the organisation and for staff members will be derived from the literature and from the data collection and this will help in the determination of the key motivators for adoption.

The study will be framed as an Action Research project. Action Research involves the active participation of the researcher and seeks to bring about change within the organisation in which it is conducted. It is an iterative process normally constructed with a longitudinal design to allow time to examine changes as iterations of the research progress. A number of possible iterations have been identified for this project and include:

- Creation of mandated communities with nominated leaders.
- Management launch.
- Multi-part email campaign.
- Training.
- Creation of interesting content.
- Addition of enterprise social networking tools
- Wiki, Blogging, Bookmarks, Discussion Forums
- Second wave of communities.
- Identification of champions/leaders and role models.

Although some quantitative data will be collected to measure the use of the enterprise social networking tools, the study is essentially qualitative in nature and will use focus groups, semi-structured interviews and content analysis to collect and analyse data. The focus groups will be made up of the members of the mandated communities and will be combined with training sessions on use of the enterprise social networking tools. The output of the focus groups will lead to the development of questions for semi-structured interviews with community members from different areas of the organisation, such as faculty, administration/support staff and management, and from different campuses. A number of topics for focus group discussion and interview themes have been established.

Research Theme	Focus Group/Interview Topics
Knowledge Sharing	Current levels
	Willingness and desire to share knowledge
	Perceived barriers to sharing knowledge
	Perceived advantages of sharing knowledge
Communities of Practice	Awareness of concepts
	Awareness and examples of existing communities
	Perceived usefulness of communities
Enterprise Social Networking	Usefulness of enterprise social networking
	Trust and security issues
	Barriers to using enterprise social networking

Content analysis will be used to evaluate the health of communities during different iterations of the project. The content of postings and discussions on the tools will be analysed using both inductively and deductively produced key-words to determine themes and patterns for relevance to the communities.

Practical Contribution

As the professional doctorate DBA programme at WIT is designed for practicing staff, it aims to provide contributions to both theory and practice. The practical contribution of this project to the organisation will be the creation of the communities' portal and the associated enterprise social networking tools, which may serve to stimulate an environment where the sharing of knowledge can become spontaneous and informal. This may have a longer term impact on organisational culture by breaking down some of the barriers to knowledge sharing that currently exist within the organisation, although the measurement of this is beyond the time-frame and scope of the study. Research has shown that increased levels of knowledge sharing in HEIs can lead to better decision making capabilities, reduced development cycle time for curriculum and research, improved academic and administrative services and reduced costs.

Ethical Considerations

In Action Research, because of the small-scale nature of the projects located within the working situations of the researcher, special care needs to be taken both for data collection and the dissemination of findings as it may be easy to recognise people and events within local situations. An ethical framework for this study will be developed and this will include information on how practical details relating to focus groups, interviews, personal data, etc., will be handled. This will be presented to all staff who agree to participate in communities so that they will be aware at all times that the communities are part of a research project. Specifically, the following will apply to the project.

- Participation in virtual communities will be completely voluntary and participants will be free to end their involvement in such groups at any time.
- Rationale for the research will be fully explained to all participants and they will be offered a copy of the final results and report.
- Focus group data will be anonymised before analysis and no personal data from focus groups will be included in the findings or final report.
- Interview data will be anonymised before analysis and no personal data from interviews will be included in the findings or final report.
- All content analysis will only take place after personal data has been removed from the content, ensuring all sources are anonymous.
- Any staff member wishing to either join or create a community will be advised that the communities are part of an ongoing research project.
- The relevant legislation, such as the Data Protection Acts of 1988 and 2003, will be complied with and no personal data will be used for any other purpose other than this research. No personal data will be stored either during or after the project.

Approval

LIT management have considered the scope and impact of this research project on the organisation and its staff, including the proposals to deal with the ethical considerations arising from the nature of the study. LIT management are satisfied that this project can proceed as outlined and will engage in frequent communication with the researcher to ensure that research ethics are complied with at all times. LIT management reserve the right to recommend alterations to the nature of the data collection and analytical methods being used or terminate the project should the ethical framework not be followed for the duration of the project.

Approved: _____

         Jimmy Bowne, Vice President Corporate Service & Capital Development

Approved: _____

         Dr Maria Hinfelaar, President.

Appendix 2: LIT Informational Email to all staff

From: Niall Corcoran

Sent: 18 December 2015 13:48

To: AllStaff <AllStaff@lit.ie>

Subject: LIT Communities Portal

Dear Colleague,

Early in the New Year, a new initiative is being rolled out across LIT which involves the use of online tools to facilitate the creation of virtual communities of practice. Communities of practice are described as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements. The aim of this project is to facilitate knowledge sharing and collaboration amongst LIT staff, across departments and campuses, through the use of enterprise social networking tools. Microsoft Yammer, which is already available through the Office 365 platform, will be the main enterprise social networking tool for this project, which may also see the introduction of wiki and blogging tools as it progresses.

The communities of practice will be accessible through a Communities Portal where staff will be able to see details of existing communities, join active communities, and learn how to create their own communities. Participation in any community is entirely voluntary and community members may join, leave or participate as they so wish. Communities are intended to be related to LIT operations and must comply with the LIT Communities Acceptable Usage Policy, which will be published in conjunction with the launch of the Communities Portal.

To begin the project, the establishment of a number of possible communities are being considered, in the areas of campus planning and development, student support, LIT Sports, Moodle users, and pedagogical skills. Please note that these are just some examples and the

creation of any community will be considered if interest and support is there for it. Any suggestions for potential communities are very welcome.

It should be noted that this initiative forms part of a Level 10 research project which will involve the use of focus groups and interviews as data collection methods. Participation in any of these activities will be entirely voluntary and any data collection will be completely anonymised and strictly dealt with in consideration of all relevant legislation and ethical issues.

If you have any questions in relation to this project, please do not hesitate to contact me.

Kind regards,

Niall Corcoran.

Niall Corcoran
Lecturer, Department of Information Technology
Limerick Institute of Technology
Moylish Park, Limerick, Ireland.
Tel: +353 61 293205

Appendix 3: LIT Communities Information Sheet

LIT Communities is an initiative to foster knowledge sharing amongst staff by creating virtual communities of practice. These communities of practice will use enterprise social networking tools as a means of communication between community members. Communities will be accessible through the Staff Portal and all staff members will be able to see a list of active communities. Communities may be open or closed. Open communities are available for any staff member to join. Closed communities are established for particular purposes and members are invited to join by the community creator(s). Closed communities are generally not of interest to those who are not part of the community when it is established. Staff members can also create their own communities. Communities are intended to be related to LIT operations and must comply with the LIT Communities Acceptable Usage Policy.

Participants in communities should be aware that LIT Communities is part of a Level 10 research project. The study involves the investigation of the relationships between enterprise social networking tools, communities of practice and staff knowledge sharing in higher education institutions. The data collection and analysis methods include focus groups, interviews and content analysis. Focus groups will be established from a number of communities and focus groups meetings will coincide with training in use of the enterprise social networking tools. Semi-structured interviews will be held with randomly selected community members from all areas of the Institute: faculty, administration staff, support staff, and management. Content analysis will be carried out on content from the enterprise social networking tools in order to assess the health of communities. It should be noted that all content will be completely anonymised before any analysis is started, such that no personal references or links of any kind will be included in the analysis.

No personal data will be stored or used during the course of this research and all focus group participants, interviewees and content disseminators will only be known to the researcher. All data collected during the course of this research will only be used for the express purpose of this research and for no other use.

By joining a community, you agree to allow any posts that you make to be available for content analysis as part of this research project. These posts or comments will be in no way attributable to you personally and your personal details will not be part of the data collected. Participation in focus groups and interviews is entirely voluntarily and will be agreed with the researcher prior to commencement.

Appendix 4: LIT ESN Acceptable Use Policy

LIT Enterprise Social Networks (ESN) Acceptable Use Policy

To be read in conjunction with the following LIT Policies:

- **Information Technology Security Policy**
- **Computer Services Acceptable Usage Policy**

Welcome to LIT Communities and Yammer. Our goal is to provide a collaborative environment to connect all of LIT's staff together, and bridge various courses and projects to share meaningful information.

Your activity in this network is governed by the following requirements:

- Everything in LIT Communities and Yammer stays in LIT Communities and Yammer (No public posts or Tweets, etc.).
- Please do not post confidential information into the main feed.
- Be respectful to other staff members. It is acceptable to disagree, but please do so in a respectful manner.
- Add value with each post.
- You are responsible for the material you post to LIT Communities and Yammer.
- It is important to substantiate ideas, but please keep messages brief and to the point.

Get started by following these Best Practices:

- When you first join, select the colleagues you want to follow. Posts from these colleagues will appear in your Following feed. To see all company posts, select All.
- Fill out your Profile information and be sure to add a Profile picture.
- Customize your email preferences in the Notifications section.
- Before asking a question, use the search bar and explore the Topics feed to explore existing content. This will help limit repetitive messages.
- Browse the Community directory and join Communities that you find important. If a specific Community does not exist, start a new one and invite members of your team to contribute messages. For best results, use Communities as a replacement for existing email groups.

- Communities should be relevant to the business and operation of LIT.
- Add Topics, Links, pictures, and Events to posts when applicable.
- Use the Yammer FAQ's and How-To-Guide to help clarify common concerns.

Please keep the following in mind when using LIT Communities and Yammer:

1. **Be polite:** Remember you are having a conversation with the LIT community.
2. **Be aware**: Confidential information should only be shared as allowed by LIT policies, preferably **<u>NOT</u>** within a collaborative network such as Yammer; but if Yammer is used, then we recommend using a private group whose members need to know that information for business purposes.
3. **Be smart:** It is VERY easy to accidentally post information to the entire LIT community rather than a specified group.
4. **Be responsible:** Usage of software and cloud storage provided by LIT is governed by the same standards and documents for other university resources:
   - **Information Technology Security Policy**
   - **Computer Services Acceptable Usage Policy**

Action Research Plan

Executive Summary

There are many recognized benefits to knowledge sharing between staff in organisations and significant competitive advantage can be gained when staff willingly share their knowledge with each other. This is especially true of knowledge-intensive organisations such as public higher education institutions. However, knowledge sharing amongst staff in these organisations has been shown to be at low levels. Communities of practice is considered to be an effective knowledge management strategy to promote knowledge sharing in organisations and enterprise social networking tools have many similarities to communities of practice that facilitate the growth and development of these communities through their use. The objective of this research is to examine how enterprise social networks can enable staff knowledge sharing in virtual communities of practice in higher education. The study is framed as an action research project and is being conducted in an Irish higher education institution. A stages of growth model is being used to manage the implementation and development of the enterprise social networking tools and a number of qualitative methods, including focus groups, interviews and content analysis are being used to explore the central research themes of the study. A contribution to theory is sought through exploring the relationship between enterprise social networking and communities of practice, and their impact on staff knowledge sharing. The study findings will also provide an opportunity for educationalists to better understand the scope and the impact of employing enterprise social networking platforms for knowledge sharing.

Introduction

The case site for the study is Limerick Institute of Technology (LIT), one of thirteen institutes of technology in Ireland. LIT is a Higher Education Institution (HEI) and has 6,500 students and 600 staff, delivering a range of degree courses from its campuses in

the mid-west region of Ireland. The researcher has been an employee at LIT since 1998, as Information Technology Manager until 2014, and as a lecturer in the Department of Information Technology since then. From practical experience, it was identified that knowledge sharing amongst staff at LIT was at a low level. Comparisons with other HEIs in Ireland over a considerable period of professional practice indicated that LIT was not atypical in this regard and it appeared to be a common trend in HEIs.

There has been considerable research into this lack of knowledge sharing amongst staff in HEIs and knowledge management practices have not been widely employed in these organisations. A number of barriers to organisational knowledge sharing in HEIs have been identified in the literature and these include organisational structures, organisational culture, the bureaucratic nature of most HEIs, and a divide and mistrust between academic and administration/support staff. Given that the collective intellectual capital of any organisation is its primary asset and can increase its competitive advantage, this lack of knowledge sharing is seen as a significant impediment to HEIs competing in their marketplace. According to some authors, the speed of curriculum revision and updating, and quality of administrative and support services are particularly impacted.

A combination of the use of enterprise social networking (ESN) and communities of practice (CoP) may help to increase staff knowledge sharing by creating an online environment where it is convenient for staff to interact in specific communities which discuss focused topics. The formal objective of this study is to examine how enterprise social networks can enable staff knowledge sharing in virtual communities of practice in higher education. A number of formal research questions have been developed from the research objective and from theory and are stated as follows:

1. What are the antecedents for staff knowledge sharing?
2. What are the dominant problems associated with the implementation of ESN and participation in virtual CoP?
3. What are the perceived benefits of knowledge sharing for both the organisation and for staff members?
4. What are the key motivators for staff to adopt the use of ESN and participate in virtual CoP?

As the professional doctorate DBA programme at WIT is designed for practicing staff, it aims to provide contributions to both theory and practice. The practical contribution of this project to the organisation will be the creation of the communities' portal and the associated enterprise social networking tools, which may serve to stimulate an environment where the sharing of knowledge can become spontaneous and informal. This may have a longer term impact on organisational culture by breaking down some of the barriers to knowledge sharing that currently exist within the organisation, although the measurement of this is beyond the time-frame and scope of the study. Research has shown that increased levels of knowledge sharing in HEIs can lead to better decision making capabilities, reduced development cycle time for curriculum and research, improved academic and administrative services and reduced costs. A contribution to theory is sought through examining the relationship between ESN and virtual CoP, and staff knowledge sharing. The study findings will also provide an opportunity for educationalists to better understand the scope and the impact of employing enterprise social network platforms for knowledge sharing.

HEI – Higher Education Institution. A tertiary educational institution, typically considered to be at University or Institute of Technology level in Ireland.

CoP – Community of Practice. Groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements.

ESN – Enterprise Social Networks. The application of social media in the corporate arena as workplace tools. Social media are computer-mediated tools that allow people to create, share or exchange information, ideas and media in virtual communities and networks.

Literature Review

Knowledge management practices are little used by higher education institutions to either manage their intellectual capital as a strategic asset in order to gain competitive advantage in their marketplace, or for knowledge sharing amongst staff in general. Many reasons have been cited for this in the literature, not least cultural and structural arrangements that are contextually unique to these organisations (Conway, 2000; Collinson and Cook, 2003; Cranfield and Taylor, 2008; Fullwood *et al.*, 2013). The systems based approach to knowledge management that characterised its early stages was also a deterrent for higher

education and this, combined with a traditional top-down implementation in organisations, led to a demise in knowledge management use in general (Bower *et al.*, 2001; Johannessen *et al.*, 2001). However, the advent of social media, and its implementation in the corporate arena, known as enterprise social networking (ESN), has given somewhat of a new impetus to knowledge management, largely due to similarities between ESN and a knowledge management technique known as communities of practice (CoP), both of which promote informal groupings and communication (Levy, 2009; Von Krogh, 2012). Social media are computer-mediated tools that allow people to create, share or exchange information, ideas and media in virtual communities and networks (Kaplan and Haenlein, 2010), and the application of these technologies within the workplaces of organisations to facilitate work-related communication and collaboration is referred to as 'enterprise social networks' by Richter and Riemer (2013). CoP are described by Wenger and Snyder (2000) as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements. The combination of these has the potential to help integrate knowledge management practices into higher education institutions; the lack of which is seen as somewhat of a paradox, given the knowledge intensive nature of these organisations (Fullwood *et al.*, 2013).

Using ESN for knowledge management is at an early stage and has some way to go before it gains mainstream acceptance and recognition of its value for the management and sharing of knowledge in organisational settings (Yates and Paquette, 2011). Indeed, this low level of acceptance and recognition might be considered as a barrier to implementation. However, according to Perez (2012), the use of ESN in organisational knowledge management contexts is poised for significant growth, and Harden (2012) concludes from the research literature that workers operating in virtual environments are "the next evolutionary stage of organisations, which could be as transformational as the industrial age". As organisations begin to employ ESN tools, models that can guide and inform the management of the growth of these tools as they evolve are required. Stages of growth (SOG) and maturity models have been widely used in information systems management since the 1970s and considerable knowledge has been established in this field regarding the management of information systems as they evolve and mature (Chan and Swatman, 2004; Solli-Sæther and Gottschalk, 2010). While ESN does present new challenges for organisations, Duane and O'Reilly (2012) propose that there is significant knowledge to be garnered from existing research of information systems SOG models,

that can be applied to focus, structure and drive future research and management of these ESN.

Action Research Design

Subjects

The 600 staff members at LIT are the target population for the study. 60% of the staff members are academic staff and 40% are management, administration, support and technical staff.

Procedures

The practical implementation of the study involves the creation of a Communities Portal and the use of ESN tools to facilitate the establishment and operation of vCoP. The portal will act as a collection point for all of the CoP in the organisation, and will allow users to see what communities are active, join communities or create new ones. It will be integrated with the Institute's existing intranet and communication systems. The primary ESN tool behind the portal is Microsoft's Yammer, which is essentially a social network that's entirely focused on a business. It facilitates group conversation and collaboration and has many similarities to familiar social media tools such as Facebook and Twitter. The addition of further enterprise social network tools, such as wikis and blogs, will be considered as the project progresses.

Prior to the commencement of the AR study, a number of preparatory steps must be undertaken. A detailed proposal was submitted to LIT management for approval, describing the social networking tools and how they might be used by staff. This included an outline of the research objectives of the study and listed some of the expected benefits to the organisation, which were be drawn from the literature. The creation of the Communities Portal and the integration of the enterprise social network involves considerable design and technical work and this is being undertaken by the Computer Services Department in LIT. The Communities Portal will be launched with a number of pre-mandated CoP, each of which will have a designated leader or moderator. Some of these were suggested by LIT management and, in addition, an information email about the project was issued to all staff at LIT, with a view towards establishing interest in

further communities. As a result of this, the Portal will be launched with at least 15 pre-mandated CoP, which can be seen in Table 1.

Computer Networks	Web Analytics	STEM Marketing
Interior Design	Office 365	STEM Maths Teaching
Research Methods	Blended Classroom	Campus Development & Planning
Health & Wellness	Pedagogical Skills	Sports
Moodle Users	Enterprise & Innovation	Technology Enhanced Learning

Table 1. CoP initially included in LIT Communities Portal

The AR project is attempting to create change over time, and seeks to achieve this through a series of interventions that are reflected upon before embarking on subsequent interventions. This research will follow the AR cycle developed by Coghlan and Brannick (2014), which has four stages of Diagnosing, Planning Action, Taking Action and Evaluating Action. Diagnosing involves developing an understanding of what the issues and sets the context and purpose of the project. Planning Action focuses on the first step or intervention that needs to take place. Taking Action involves the implementation of the intervention. Evaluating Action examines the outcomes of the action, whether intended or unintended, with a view towards determining if the initial diagnosis and the action taken were correct, if the action was taken in an appropriate manner, and to determine what feeds into the next cycle of diagnosis, planning and action. A series of interventions is planned for this project and these are outlined in Table 2.

AR Stage	Planned Intervention	Anticipated Outcome
1	Launch of LIT Communities Portal with executive management backing. The Portal will have pre-mandated communities as outlined in Table 1.	Initial participation in the communities by members who have been included in the setup. Requests by additional staff members to join communities.
1	Training in CoP and the full use of the ESN tools.	Increase in level of engagement and quality of engagement by community members.
2	Awareness campaign, through email, advertising on Staff Portal and newsletters.	Further increase in community participation and requests from staff for the addition of further CoP.
2	Launch of second wave of communities.	Increased number of users.
3	Integration of additional ESN tools such as wikis, blogs, discussion forums, RSS feeds.	Increased level of use, beginning with innovators and early adaptors.
3	Training on use of new tools.	Use of the ESN reaching a sustainable level of usage.

Table 2. AR Stages with Planned Interventions and Anticipated Outcomes

Timeframe

The project has three planned AR stages spanning a period from February 2016 to February 2017. Each stage will be of approximately equal duration. Prior to the first stage, the development of the Communities Portal and the identification of the first CoP will take place from December 2015 to January 2016. The Communities Portal is scheduled for launch on 1st February 2016 and the mandated CoP will be active from this date. This is the first part of two-part intervention in the first AR stage. The second part of the intervention in Stage 1 involves the provision of training for the mandated CoP. The first part of a two-part intervention in Stage 2 involves an awareness campaign amongst staff

using available media. The anticipated outcome of this intervention is requests for the creation of further CoP and the creation of these marks the second part of the intervention, planned for May 2016. Stage 3 also has a two-part intervention, the first involves the introduction of additional ESN tools and the second involves training on the use of the tools. This Stage is scheduled to happen between September 2016 and February 2017.

Resources

The project is being run by the researcher in conjunction with the Computer Services Department at LIT, and personal from this department will be involved in the development and maintenance of the Portal, ESN tools, CoP, and the provision of training in the use of tools.

Data Collection & Analysis

Focus groups will be used initially to determine participants' perceptions, opinions, beliefs, and attitudes towards a number of topics which are outlined in Table 3. A focus group is a form of qualitative research in which a group of people are asked about their perceptions, opinions, beliefs, and attitudes towards concepts, products, services or ideas. These groups are interactive where members are free to talk openly with other group members and discussions are of an informal nature. The focus groups will be selected from the pre-mandated CoP and will be held in conjunction with training for each CoP, during Stage 1 of the AR project. The data derived from the focus groups will be analyzed using the Nvivo software application which will involve coding the data to identify emergent themes and patterns which can be compared to theory, and then used to formulate questions for the next stage of the data collection process – interviews.

Research Theme	Focus Group and Interview Topics
Knowledge Sharing	Current levels
	Willingness and desire to share knowledge
	Perceived barriers to sharing knowledge
	Perceived advantages of sharing knowledge
Communities of Practice	Awareness of concepts
	Awareness and examples of existing communities
	Perceived usefulness of communities
Enterprise Social Networks	Usefulness of enterprise social networks
	Trust and security issues
	Barriers to using enterprise social networks

Table 3: Focus group and interview topics for research themes

Semi-structured interviews with staff members will be conducted and the interview data will be analyzed using the Nvivo software application. The same questions will be asked of all interview subjects, but with some flexibility to develop lines of enquiry that might be particularly relevant to exploring emergent themes. The purpose of these interviews will be to collect more detailed data on attitudes towards knowledge sharing, participating in CoP and using ESN tools, and will take place during Stages 2 and 3 of the AR project. The sampling method employed for the target population (LIT staff) will be stratified sampling, where a deliberate effort will be made to make the sample representative of the target population. Subcategories will be based on community members, non-users, and staff categories of faculty, administration and support staff, and management.

Content analysis will be conducted on postings in the ESN tools. This analysis can be used to examine the relationships between the enterprise social network and vCoP where the main themes and patterns in the conversations and postings can be determined and examined for relevance to the communities. In particular, interest and activity in communities can be evaluated using this method. This will involve coding the data and, in order to determine which concepts are most cited throughout the data, the frequency of each code will be counted. The method is similar to constant comparison analysis but

instead of grouping the codes together, the researcher counts the frequency of use of each code. Content analysis will be conducted during all three stages of the AR project.

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Paper 3

Investigating Staff Knowledge Sharing in an Irish Higher Education Institution through Action Research

Preface

The development of the research design and initial findings paper took place between January 2016 and March 2016, when it was presented for external examination at WIT, and recommended without review, and this version is presented here. The structure of the DBA research paper series required that the methodology, research design and implementation be presented over papers two and three of the series. However, given the timeline of the DBA and my AR project, it was not possible to account for the full implementation of each of the three cycles of the project until they were complete. Therefore, while this paper presents a complete and detailed description of the research design, the implementation only accounts for Cycle 1 of the AR project, which ran from September 2015 to January 2016, and the initial findings are related to the data collection from this cycle.

The development of this paper took place in tandem with Cycle 1 of the AR project, and I was starting to make extensive use of reflective journaling to capture my thoughts and generate ideas for further interventions. However, I was doing this without following any process or method, and I was simply recording incidents, reflecting on them and trying to generate ideas from the writing process. Although the fact of writing things down helped my thought processes and the generation of new ideas, it was neither an efficient nor a satisfactory process. Leitch and Day (2000) maintain that not enough attention has been given to the nature of reflection in the AR process, and its relationship to the goals, processes and outcomes. However, it is being increasingly recognised as an important element of any research project and, according to Jasper (2005), it needs to be recognised as a central part of the methodology of research studies. Reflective journaling is a key component of reflective practice and central to the notion of learning from experience (Jasper, 2005). According to Schön (1983), reflective practice involves reflecting on actions to facilitate a process of continuous learning. Experience alone does not lead to learning, therefore deliberate reflection on experience is required to do this (Loughran, 2002). Schön (1983) describes two types of reflection: reflection-on-action, which is thinking about the event after it happens, and reflection-in-action, which is thinking about something while you are doing it. According to Finlay (2008), reflection-on-action concerns reviewing, describing, analysing and evaluating events or actions with a view towards improving future occurrences of similar events or actions. As reflective journaling happens after an event or action has taken place, it falls into the category of

reflection-on-action. A number of models of reflection have been advanced in different fields of professional practice and education, mostly based on reflection as being a retrospective activity (Finlay, 2008). There are three fundamental processes associated with all of these models: retrospection, thinking about an event or action; self-evaluation, critically analysing and evaluating the action and feelings associated with it, and reorientation, using the results to influence future approaches to similar events or actions.

From an examination of the AR literature, Leitch and Day (2000) conclude that the goals of both reflective practice and AR are essentially the same, that is, to change and improve, and specific tools for reflection are increasingly being incorporated into AR methodologies from other contexts and disciplines. Identifying reflection as being at the core of AR processes adds to the richness and learning possibilities for both researchers and participants, and enhances AR as a research technique. According to Dixon *et al.* (1997), Kolb's experiential learning cycle was based on earlier work by Lewin, Dewey and Piaget, and is one model of reflection that could be applied to AR (Kolb, 1984). The model is based on the conversion of information into knowledge, taking place after an event has occurred. It involves the practitioner reflecting on the event to gain a general understanding of the concepts encountered, and then testing these understandings in a new situation, continuously applying the knowledge that was formed (Rolfe *et al.*, 2001). Gibbs (1988) proposed the use of what he termed *structured debriefing* to provide structure to the reflection process in Kolb's experiential learning cycle, and developed a six-step model that can be used to guide the reflective process (Figure 1).

This model begins with a description of what happened during the chosen episode for reflection, including the practitioner's involvement with it. This is followed by an analysis of their reaction to the event in terms of how they were thinking and feeling at the time. The third step involves an evaluation of the event and determining what was good and bad about the experience, leading to a sense-making analysis from which conclusions about what might have been done differently are drawn. From this, an action plan for dealing with similar events in the future is drawn. According to Park and Son (2011), stages one to four of the model are typically formed as a complete circular process for reflective writing. Because of the structure that the model lends to the reflective process, I have used it for reflecting on the interventions in each AR cycle, typically in the *Evaluating* phase, how I conducted the focus groups and interviews, and for other events

that were recorded in the reflective journaling process such as informal conversations and other events of note.

Figure 1. Gibbs (1988) Reflective Cycle
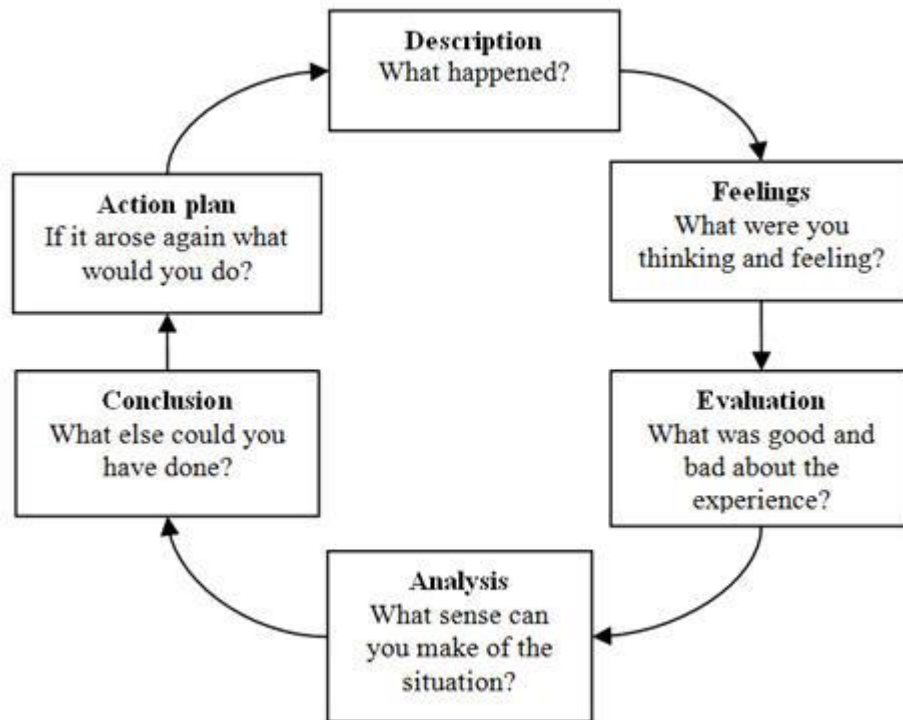
A number of ethical issues for the study are dealt with in Paper 3. However, the ethical complexity of this research is further extended by the implementation and use of ESN and vCoP at its core. The use of ESN for communication and collaboration amongst staff presents a relatively new challenge for organisations. Using an ESN presents risk to an organisation and an Acceptable Use Policy (AUP) is the most effective risk mitigation tool available. Although most organisations have AUPs in place for information systems and even social media, these are not particularly relevant to the manner in which ESN is used. At the heart of this lies the conflict between the inherent flexibility of use of ESN and the control focus of traditional AUPs. According to Doherty *et al.* (2011), another problem with traditional AUPs is that their primary role tends to be a mechanism for dealing with unacceptable behaviour, rather than being proactive through the promotion of desirable and effective behaviours, highlighting the negative aspects rather than accentuating the positive ones. David (2002) concludes that the tendency to develop strict policies can be due to previous negative experiences and perceptions, and these can restrict and limit social based technologies, through effectively discouraging their use.

Because ESN is internal to an organisation, the focus of the AUP should not be IT security related, which is another aspect of traditional AUPs. The content of an ESN is visible only to the staff of the organisation and not to anyone outside of the corporate network. Therefore, the focus of the AUP should be on how staff use the ESN to communicate with each other, with specific attention paid to how corporate information is shared on the ESN, and to ensure that it is used for the purposes of the organisation. A study by Duane and Finnegan (2003) demonstrates that appropriate and effective policies can have an empowering impact on an organisation and its employees. Having an overly negative AUP can serve to stifle the growth of an ESN as staff will view it as being restrictive and controlling and consequently will be reluctant to post content or participate in conversations. However, the AUP does need to provide guidelines for use that offer sufficient protection for both the organisation and its users. Husin and Hanisch (2011) suggest a more practical and non-authoritative approach may help an organisation to harness the benefits of their ESN. This requires a full understanding of social media and their use within organisations by policy makers, in order to ensure that AUPs remain flexible but still provide the necessary guidelines and protection to employees and the organisation.

The AUP for the ESN should include rules, codes of conduct and practical guidelines, be positive, constructive, and in line with organisational policies and culture. Its focus should be positive and explanatory, encouraging use by providing positive examples and suggestions. It should also require that any content posted be related to the business of the organisation. The role of senior management in the development and implementation of the AUP is crucial, and according to Husin and Hanisch (2011), it is essential that they are seen to use the ESN themselves whilst adhering to the policy. This serves to assist in improving relationships with staff and empowering the AUP such that it is not seen as a control tool (Duane and Finnegan, 2003). This study used a framework proposed by Husin and Hanisch (2011) to develop an AUP for the Yammer installation in the case site. This framework is based on an understanding of the legal obligations and impacts for employees while retaining a degree of flexibility to allow the organisation to benefit from the ESN. The AUP requires users to accept it before they can join the ESN, helping to ensure that activity on Yammer is positive, constructive, and in line with the organisation's policies and culture. It is primarily positive and explanatory, providing examples and suggestions, and it requires that content is appropriate and relevant to the

organisation. The availability of training for ESN users is another important factor is ensuring correct use of the system, and supplements the advice provided in the AUP. Training is available for all ESN users and training materials are also accessible on Yammer on an ongoing basis.

Ethical issues presented by staff forming, and participating in, vCoP also require some consideration. Although much of the available guidance from the literature pertains to CoP as opposed to vCoP, it is assumed that the principles apply equally to both, and the terms CoP and vCoP are used where appropriate. According to Wenger (2010), there are many constraints, impositions and demands on CoP, including external factors over which participants have little control. CoP may not be harmonious or egalitarian and conflict may arise as a result. Because CoP are self-governed, all sorts of undesirable things may be produced, such as racism or corruption, and may be dysfunctional, counterproductive or even harmful. A CoP can be a place of "collective mediocrity or contribute to systematically counterproductive patterns" (Wenger, 2010, p.195). In order to mitigate against a vCoP developing any such characteristics and delivering the organisational and individual benefits that are the very reason for its existence, a number of pre-emptive measures can be taken, including the development of a code of ethics, or a framework for the vCoP to work within, and training for participants and community leaders. Wenger (2010) maintains that the performance of a CoP will be dictated by the behaviour of those who are engaged in it, despite whatever efforts are made to dictate, shape or mandate practice within it. However, the more that participants understand the concepts, workings and purposes of CoP, the more likely they are to conduct themselves in a manner that will provide a positive contribution to the community. Furthermore, having an established set of principles and guidelines will help both community members and leaders to work within parameters, and provide support should something go wrong.

According to Rohde (2004), a code of ethics for CoP should be developed as a working document and finalised as a process of negotiation between community members. In this way, the development of a code of ethics will support the process of establishing a CoP (Lave and Wenger, 1991). It should include such things as criteria for membership, the structure of the community, the participatory introduction and adaptation process, the nature of content, guidelines for information management, roles and access rights, privacy and confidentiality matters, cultural aspects of cooperation and trust, and guidelines on etiquette and behaviour (Rohde, 2004). A number of these will be common for all

communities within an organisation and the organisation should have an established baseline document that a newly formed CoP can use to facilitate the negotiation process for their own set of operational guidelines and code of ethics. Such a transparent negotiation process undertaken by a new CoP should contribute to the building of trust and social capital within the community, and lead to a set of agreed commitments by the community members that will provide the CoP with a solid foundation on which to develop. The availability of training for CoP members and leaders is also an important factor in the success of a community. Increasing the understanding of the concepts, purpose and functionality of a CoP, including the roles and responsibilities of leaders and champions, can help to ensure the viability and stability of a community over time. While it is very important to provide training during the embryonic phase of a CoP, supplementary training material should also be made available on the ESN for continual reference.

Table 1 presents the approach that was taken for dealing with the ethical issues that were encountered during each phase of the AR cycles for this study, and is presented according to the framework suggested by Walker and Haslett (2002), grounding the ethical issues in the AR cycles. To achieve this, I posed ethical questions around the cyclical activities of *Diagnosing*, *Action Planning*, *Action Taking*, *Evaluating* and *Specifying Learning*. The processes of ensuring confidentiality and anonymity, obtaining consent, and balancing different and conflicting needs, were actualized during these phases by carefully examining who was affected and how they were affected

Table 1. Ethical Issues and approaches for each phase of the AR cycles

Ethical Issue	DIAGNOSING	ACTION PLANNING	ACTION TAKING	EVALUATING	SPECIFYING LEARNING
Personal over-involvement of the researcher	Develop a research philosophy that confronts and deals with this dilemma	Plan AR interventions that minimise the involvement of the researcher where possible	Implement interventions in a manner that minimise the influence of the researcher where possible	Ignoring personal relationships during data analysis	Present findings in an impartial and professional manner
Power structure and political culture	Engage with management from the beginning	Obtain management support and approval	Develop and demonstrate political astuteness	Understand the organization's power structure and political culture	Illustrate and disseminate findings according to the organization's power structure and political culture
Confidentiality and anonymity/Recognition of people and events	Obtain ethical approval from relevant Ethics Committees	Plan how data will be collected, analysed and stored	Provide necessary reassurances of confidentiality and anonymity during data collection	All data gathered should be completely anonymised before analysis	Written findings should contain no personal references or means of identification by position
Informed consent	Obtain ethical approval from relevant Ethics Committees	Develop appropriate information sheets and consent forms	Clearly brief participants concerning the experimental nature of the action taking	Give participants the opportunity to request that comments be erased	Erase comments from transcripts as necessary
Resistance to change	Recognise that goals may not be achievable because of this	Account for resistance to change in planning interventions	Note occurrences as part of reflective journaling process	Analyse why there is resistance to change	Develop interventions for further AR cycles that can minimise resistance
Goal dilemma	Develop and agree organizational and individual goals with management	Ensure that practical and research goals are compatible	Ensure that practical and research aims are achieved through reflective journaling	Analyse reflective notes to resolve goal dilemmas	Present findings that clearly delineate practical and research goals
Acceptable ESN use	Understand existing organizational policies	Develop an AUP and suitable training for ESN use	Implement AUP and training	Analyse suitability of AUP for ESN usage	Revise AUP as necessary
CoP participation	Agree management support for the introduction of CoP	Develop organizational code of ethics and training materials for CoP	Facilitate development of code of ethics and operational guidelines for individual CoP and provide training	Analyse impact of code of ethics and training on CoP performance	Revise code of ethics and training as necessary

Abstract

The performance of higher education institutions is impacted by low-levels of knowledge sharing between staff. The use of social media tools for knowledge sharing in organisations is growing and is perceived to be beneficial in this regard. A knowledge management technique known as communities of practice (CoP) can be supported in virtual settings through the use of these tools, and virtual communities (vCoP) may enable knowledge sharing activities. The objective of this research is to investigate how the use of these social media tools in virtual communities can enable knowledge sharing in higher education contexts. The study aims to identify the antecedents for staff knowledge sharing and successful implementation of enterprise social networking (ESN) tools, while also identifying the dominant problems associated with ESN implementation. The perceived benefits of knowledge sharing for both the organisation and for staff members are also explored and used to determine the key motivators for adoption of the ESN tools and participation in vCoP. The study is framed as an Action research (AR) project and the research design includes an adaptation of an AR process that includes fives phases in each cycle. The first phase, called Diagnosing, involves the identification of primary problems that are to be addressed within the host organisation and produces a detailed conceptual model that is used to shape the following phases. The Action Planning phase sees the development of a package of interventions to be implemented in Cycle 1. The Action Taking phase includes the introduction of the data collection instruments, which are focus groups, semi-structured interviews, content analysis, and reflective journaling. Cycle 1 of the AR project ran from September to December 2015 and the initial findings are presented and summarised. The outcomes of the Cycle 1 interventions are then reflected upon in order to inform the selection of interventions for the next cycle of the AR process.

1.0 Introduction

This study is rooted in the complex and rapidly changing convergence of higher education, information systems, and knowledge management. The implementation of knowledge management practices in higher education institutions (HEIs) has been identified as being at low levels by a number of studies, and the consequent lack of staff knowledge sharing has a significant negative impact on the overall performance of these organisations (Cheng *et al.*, 2009; Sohail and Daud, 2009; Mavodza and Ngulube, 2012;

Fullwood *et al.*, 2013; Al-Husseini and Elbeltagi, 2015). In contrast, the use of social media tools for organisational knowledge sharing, known as enterprise social networking (ESN), is gaining in popularity and has been identified as beneficial to the performance and competitive advantage of organisations (Leonardi *et al.*, 2013; Ellison *et al.*, 2014; Friedman *et al.*, 2014; Leftheriotis and Giannakos, 2014). These tools can be used to support a knowledge management technique known as communities of practice (CoP), described by Wenger and Snyder (2000) as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements, resulting in the creation of inter and intra-organisational groups called virtual communities of practice (vCoP). According to Dean *et al.* (2013), an important aspect and function of CoP is increasing organisational performance through the creation of shared identity and purpose. The objective of this research is to investigate how ESN can enable staff knowledge sharing in vCoP in HEIs.

Ng and Pemberton (2013) state that the concept of CoP has been extensively examined within the corporate context and can produce many benefits for both individuals and organisations, and, according to Wiig (1999), these benefits may also apply to HEIs. However, the majority of research into using CoP in HEIs has been done in the context of teaching and learning, and consequently very little is known about how CoP can benefit the wider HEI organisation (Kimble *et al.*, 2008). HEIs are rarely to the fore in the implementation of information systems for either their teaching or corporate practices and, according to Leidner and Jarvenpaa (1995), academic institutions typically lag behind businesses by about ten years in the adoption of new technologies. This is in contrast to academics themselves, who are known to be early adopters of social technologies (Eysenbach, 2011) and research community software (Lin, 2012). Given that ESN are only recently becoming commonplace in organisations, it is hardly surprising then that they have not yet gained a significant foothold in HEIs. Accordingly, there has been little research into how ESNs might be used to enable knowledge sharing in HEIs (Ortbach and Recker, 2014). According to Nistor *et al.* (2014), where technology is employed to facilitate communication in CoP, the sustained participation of members requires the acceptance and use of the technology in the first place, and a critical mass must also be achieved (Ren *et al.*, 2012). According to Preece (2000), this critical mass of activity is required to attract other users, and without it, the perception of the usefulness of the knowledge sharing system will inhibit its use (Sharratt and Usoro, 2003).

In response to this, the study developed a number of research questions to address these issues:

RQ1:   What are the antecedents for staff knowledge sharing?

RQ2:   What are the dominant problems associated with the implementation of ESN and participation in vCoP?

RQ3:   What are the perceived benefits of knowledge sharing for both the organisation and for staff members?

RQ4:   What are the key motivators for staff to adopt the use of ESN and participate in vCoP?

The contextual setting for the study is Limerick Institute of Technology (LIT) with approximately 6,500 students and 600 staff, delivering a range of courses from its campuses in the mid-west region of Ireland. The researcher is a staff member with almost 20 years of service in LIT and has held both service management and academic positions. The practical aspect of the project involves the implementation of ESN tools in the organisation, specifically Microsoft's social networking tool called Yammer, and the promotion and support of these to facilitate knowledge sharing in a HEI environment and the establishment of vCoP. The approach to this study embraces the researcher's place within it, and fully recognizes that a priori knowledge and existing values will invariably intrude upon the observation. From this understanding, it was considered that action research (AR) would be the most appropriate research strategy to adopt for the study. AR involves the active participation of the researcher and seeks to bring about change within the organisation in which it is conducted. It is an iterative process constructed with a longitudinal design to allow time to examine changes as iterations of the research progress (Baum *et al.*, 2006). According to Baskerville and Myers (2004), the goal of AR is to solve existing practical problems while generating scientific knowledge at the same time. This study is qualitative in nature and uses a number of data collection methods, including content analysis, focus groups, semi-structured interviews and reflective journaling.

The rest of this paper begins with a presentation of the research design, which includes a description of the AR process and the model adopted for the study. The different phases of the AR process are outlined, with considerable attention given to the early phases of Diagnosing and Action Planning, which constitute part of the research design process. A presentation of operational details and information on the ESN tools being employed is included in a description of the third phase, Action Taking. Descriptions of the design of

the data collection instruments and procedures are also presented here, and issues of validity and reliability in the context of this study are addressed. The implementation of the interventions for the first AR cycle is described and the initial findings from this cycle are presented. The findings are mapped to the research questions and also presented as a narrative. Finally, a summary of the initial findings is presented along with reflections on the first AR cycle.

2.0 Research Design

According to Susman and Evered (1978), AR can be viewed as a cyclical process with five phases of diagnosing, action planning, action taking, evaluating and specifying learning. Although some of these phases may be conducted jointly, they are all necessary for a study to be truly defined as AR.

Figure 1. Phases of the AR process, adapted from Susman and Evered (1978)
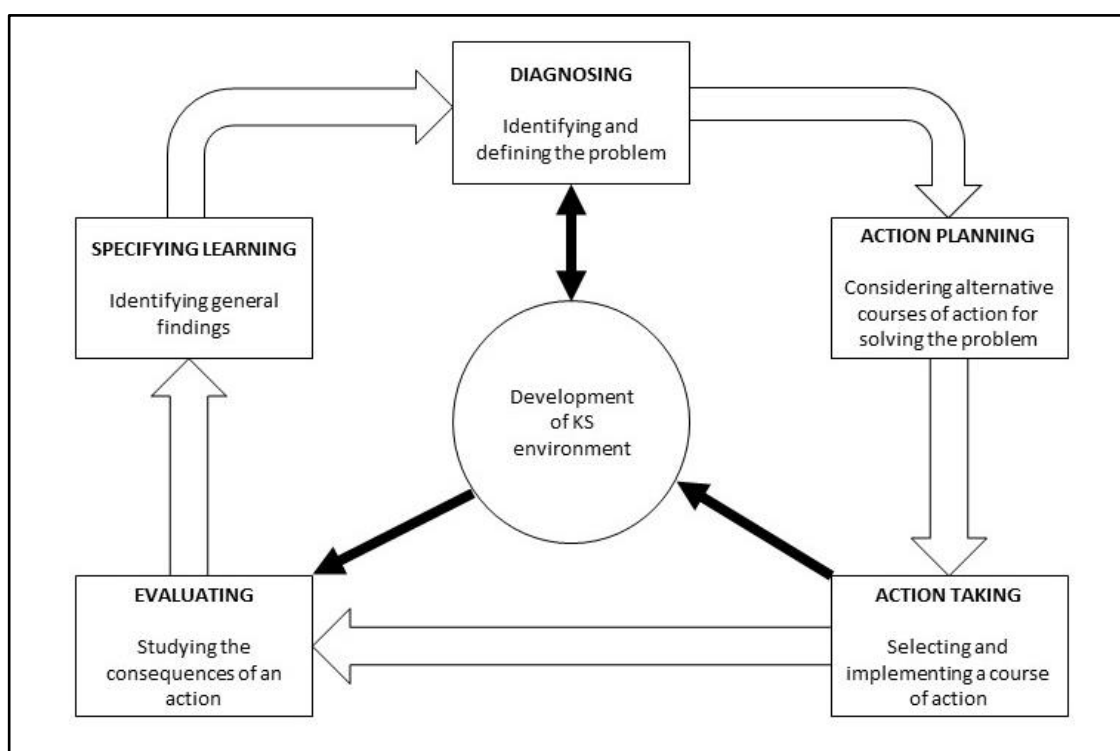
This view includes diagnosing as a phase which many researchers omit, preferring to adopt the simpler four phase process of plan, act, observe and reflect (Koshy *et al.*, 2010; Coghlan and Brannick, 2014). However, it is closer to the original AR model proposed by Lewin (1946), which included defining the issue as a phase of the AR process. The first phase, called *Diagnosing*, involves the identification of primary problems that are to be addressed within the host organisation, and is considered to be an integral part of the

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research design. Before the first AR cycle begins in reality, this phase involves identifying the problem at the outset and then undertaking a review of the existing literature to help frame and develop a conceptual model for the study. For this study, a description of the problem, background information and the literature review are presented in Paper 1 of this paper series.

This AR project is scheduled to run from September 2015 to August 2016 and has three cycles, each lasting for four months. Figure 2 shows the AR cycles and data collection methods mapped to the predicted use of the ESN, based on a stages of growth (SOG) model. These models are generally based on the work of Rogers (1962) and Utterback (1971), on the theory of diffusion of innovations, where diffusion is the process by which an innovation is communicated through certain channels over time among the participants in a social system. According to Utterback and Abernathy (1975), the progress of an innovation, follows an S-curve, passing through different stages of maturity over time, mainly as a result of many minor product or process improvements. A description of the development of SOG models is given in Paper 1 of this paper series.

Figure 2. AR Cycles & Methods with predicted ESN use (Sep 2015 - Aug. 2016)
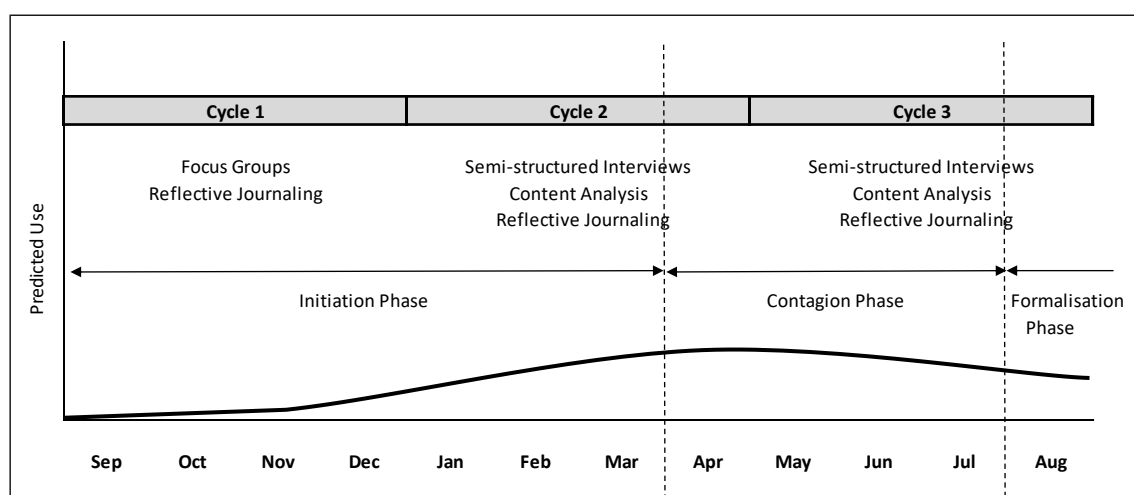
In the case of this study, these minor improvements can be considered to be the interventions carried out as part of the AR cycles, and each cycle can be mapped to a stage on the model. SOG models have a number of different stages, depending on specific models, but are generally considered to be an *Initiation* or start-up stage, *Contagion* and *Formalisation* stages, during which sustained growth is normally predicted, and a *Maturity* stage, which occurs when a critical mass of use has been achieved. If this critical mass is not achieved then a tipping-point can occur and the system can stagnate or fail

completely. Although SOG models would normally predict constant growth, the Contagion phase for this project includes an anticipated reduction in use from June to August 2016. This is to account for the summer recess where the majority of staff in the Institute are on vacation and, although some use may take place over mobile devices, it is expected that an overall decline in use will be measured during this period.

2.1 AR Phase 1 - Diagnosing

The conceptual model was developed from the four research questions and focuses on how a knowledge sharing environment can be created by determining the antecedents for it and the motivators for staff to engage with it, whilst determining the dominant problems from both an organisational and individual perspective so that they can be managed. The organisational and individual benefits are also determined as outputs from the model, which is shown in Figure 3. A summary of the model inputs is provided in Table 1.

According to Mládková (2011), workers will only share knowledge to any great extent when "organisations create a convenient environment for cooperation and knowledge sharing and support them with the knowledge they need". In addition to the absence of a convenient means of sharing knowledge, if there is a lack of predetermined and focused topic groups, knowledge sharing will be further inhibited. Many knowledge management programmes have failed because the strategic intent was too vague and focused on broad aspirations such as improving communications or developing community and learning (Venters, 2010). Hew and Hara (2007) discuss the role of community in determining whether workers want to share knowledge with one another, and Gray (2004) concludes that workers are reluctant to share knowledge when they feel little identification with a community.

Three key antecedents to create these conditions for knowledge sharing have been identified. These are: having an organisational culture that makes peer sharing of knowledge just as valid as top-down sharing (Azudin *et al.*, 2009; Zboralski, 2009; Annabi and McGann, 2013); management support, which includes the provision of funding, training, promotion and appreciation (Wenger and Snyder, 2000; Paroutis and Al Saleh, 2009; Zboralski, 2009; Wang and Noe, 2010; Mosha *et al.*, 2015); and the role of community leaders, who play an important part in motivating staff to interact with each other and trust each other (Moran and Weimer, 2004; Zboralski, 2009; Annabi and McGann, 2013).

Figure 3. ESN Enabled Knowledge Sharing in HEIs: Conceptual Model
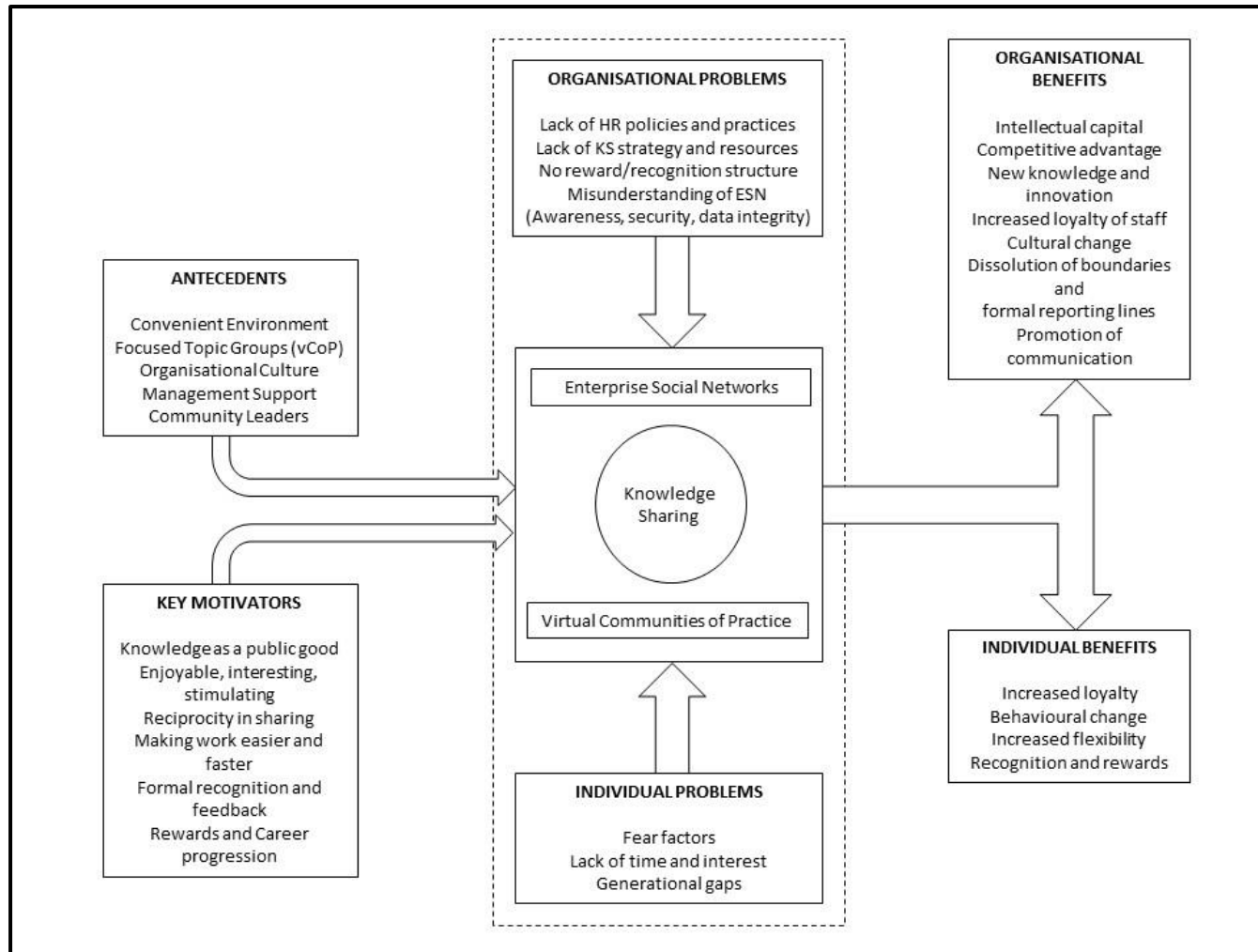
Table 1. Summary of Model Inputs

Category	Input	Source
Antecedents for knowledge sharing	Convenient environment	(Mládková, 2011)
	Focused topic groups	(Venters, 2010)
	Community	(Gray, 2004; Hew and Hara, 2007)
	Organisational culture	(Azudin et al., 2009; Zboralski, 2009; Annabi and McGann, 2013)
	Management support	(Wenger and Snyder, 2000; Paroutis and Al Saleh, 2009; Zboralski, 2009; Wang and Noe, 2010; Mosha et al., 2015)
	The role of community leaders	(Moran and Weimer, 2004; Zboralski, 2009; Annabi and McGann, 2013)
Dominant problems associated with ESN implementation and vCoP participation	Lack of HR policies and practices, and knowledge sharing strategies	(Riege, 2005; Pei Lyn Grace, 2009)
	Misunderstanding of the role of social media (awareness, security, data integrity)	(Mosha et al., 2015)
	Fear factors	(Ardichvili et al., 2003; Newell et al., 2007; Hislop, 2013)
	Lack of rewards, recognition and incentives	(Paroutis and Al Saleh, 2009; Wang and Noe, 2010)
	Lack of time, resources and interest	(DiMicco et al., 2008; Hislop, 2010; Mosha et al., 2015)
	Generational gaps	(DiMicco et al., 2008; Denyer et al., 2011)
Key motivators for staff to adopt the use of ESN and participate in vCoP	Knowledge as a public good	(McLure and Faraj, 2000; Hislop, 2013)
	Intrinsic motivators: enjoyable, interesting, stimulating.	(DiMicco et al., 2008; Krämer and Winter, 2008; Denyer et al., 2011)
	Reciprocity in sharing, making work easier and faster and ease of use	(Vuori and Okkonen, 2012)
	Formal recognition and feedback from peers and management, financial rewards and possible career progression	(DiMicco et al., 2008; Hislop, 2013; Paulini et al., 2014)
Organisational and individual benefits	Creation of new knowledge and innovation	(Sohail and Daud, 2009)
	Increased loyalty of staff	(Wenger et al., 2002; Hislop, 2013; Mosha et al., 2015)
	Dissolution of boundaries and reporting lines; flexible; vehicle for cultural change; sense of professional commitment; enhance members' reputation	(Allee, 1997; Wenger and Snyder, 2000; Clemmons Rumizen, 2001)
	More open and participative in promotion of communication	(Denyer et al., 2011; Leonardi et al., 2013)

While the motivations for staff to share knowledge, use ESN and participate in vCoP are varied and influenced by many factors, including organisational culture and structure, a number of key motivators can be identified from the literature. Both McLure and Faraj (2000) and Hislop (2013) discuss the concept of knowledge as a public good, and Ardichvili *et al.* (2003) conclude that when knowledge is viewed as a public good belonging to the whole organisation, workers are motivated to share it. Many authors divide motivating factors into intrinsic and extrinsic, where intrinsic motivation implies that an individual finds an activity interesting, enjoyable and stimulating, and will participate for those reasons and to achieve personal growth (Denyer *et al.*, 2011). For example, Vuori and Okkonen (2012) describe intrinsic motivators as reciprocity in knowledge sharing, making every-day work easier and faster, and ease of use of knowledge sharing systems. Types of external motivation include formal recognition and feedback from peers and management, financial rewards and career progression (Hislop, 2013; Paulini *et al.*, 2014). DiMicco *et al.* (2008) classify three themes of motivation for sharing knowledge on ESN, labelled as "caring, climbing and campaigning", while emphasizing that these are not mutually exclusive categories. These categories can be plainly described as the desire to share on a personal level, the attainment of benefits such as career advancement, and the ability to convince others, such as management, to support ideas and projects.

Many of the organisational and individual barriers to knowledge sharing stem from the presence of an organisational culture that does not promote or encourage knowledge sharing, and this is evidenced in management practices within these organisations. For example, Pei Lyn Grace (2009) identifies a lack of human resource policies and practices to support the use of social media tools for knowledge sharing as a critical problem. Riege (2005) discusses a lack of knowledge sharing strategies and highlights the lack of a connection between such strategies and the use of social media tools. A misunderstanding of the role of social media is discussed by Mosha *et al.* (2015), who examine both management and individual perspectives in terms of lack of awareness, security concerns and data integrity. A number of authors cite fear as a major inhibitor to participation, and include fear of the loss of status and power, and the fear of exposure to management and colleagues which might lead to ridicule in particular (Ardichvili *et al.*, 2003; Newell *et al.*, 2007; Hislop, 2013). The lack of rewards, recognition and incentives for knowledge sharing from management is highlighted in a number of studies (Paroutis and Al Saleh,

2009; Wang and Noe, 2010), and individual barriers such as lack of time, resources, interest and generational gaps are also widely discussed (DiMicco *et al.*, 2008; Hislop, 2013; Mosha *et al.*, 2015).

There is a general acceptance in the literature that knowledge sharing, and the use of ESN and vCoP in that context, has benefits for the organisation in terms of increased intellectual capital and improved performance. However, the direct impact of increased organisational knowledge sharing on these factors can be difficult to quantify. According to Sohail and Daud (2009), the outcome of knowledge sharing is the creation of new knowledge and innovation that will improve organisational performance. The influence of increased knowledge sharing on the loyalty of staff to remain working within their institution is highlighted by both Hislop (2013) and Mosha *et al.* (2015), and Wenger *et al.* (2002) connect this with fostering beneficial behaviour change at the individual level, where isolated and distributed pockets of expertise in organisations are connected.

The benefits of both CoP and vCoP are widely explored in the literature and a number of studies conclude that they have the capability to cut across departmental boundaries and formal reporting lines, are more flexible than traditional organisational units, can be a vehicle for cultural change, and can provide a sense of professional commitment and enhance members' reputation (Allee, 1997; Wenger and Snyder, 2000; Clemmons Rumizen, 2001). The use of ESN for delivering organisational benefits has some support. Denyer *et al.* (2011) propose that ESN are more open and participative than traditional methods of communication and this is supported by Leonardi *et al.* (2013), who conclude that ESN can be used by organisations to promote communication amongst employees.

The results of the diagnosis and the outputs from the conceptual model indicate that there are low levels of staff knowledge sharing in higher education organisations. This builds on the literature review presented in Paper 1 of this paper series, and adds a level of detail to allow the research questions to be investigated in the contextual setting during subsequent phases of the AR process. The model suggests that the implementation of an ESN in LIT, and the promotion and support of its use in vCoP, will enable staff knowledge sharing activities, providing a number of individual and organisational benefits.

2.2 AR Phase 2 – Action Planning

The *Action Planning* phase involves the consideration of alternative courses of action for addressing the problem. The interventions to be carried out by the researcher in the organisation are identified in this phase and are guided by the theoretical framework (Olesen and Myers, 1999). The package of interventions for Cycle One of this study are described in Table 2. A number of these interventions are derived from the antecedents from the theoretical model, as these must be in place for the implementation to be successful (Paroutis and Al Saleh, 2009; Zboralski, 2009; Annabi and McGann, 2013). The specific interventions that correspond to antecedents in the model are marked with an asterisk.

Table 2. AR Cycle 1 – Interventions Package

No.	Intervention	Antecedent
1	Attain executive management backing for the project.	*
2	Investigate ESN tools and select for implementation.	
3	Design and build portal for vCoP.	
4	Seek expressions of interest for CoP (email and follow up).	
5	Identify potential community leaders.	*
6	Build vCoP on ESN with community leaders.	*
7	Hold awareness sessions for staff (Staff Development Day).	
8	Provide training for CoP and community leaders.	*
9	Identify ESN champions.	

According to a number of authors (Wenger and Snyder, 2000; Paroutis and Al Saleh, 2009; Zboralski, 2009; Wang and Noe, 2010; Mosha *et al.*, 2015), management support is a prerequisite for the establishment of a successful knowledge sharing environment, therefore executive management backing for the project must be agreed and attained prior to commencement. A number of technical prerequisites are necessary, largely involving the installation and setup of the ENS and community portal, and these correspond to interventions 2, 3, 4 and 6 in Table 2. The importance of community leaders is highlighted in a number of studies (Moran and Weimer, 2004; Zboralski, 2009; Annabi and McGann, 2013), and potential community leaders who are fully committed to using ESN for vCoP, rather than just solely interested in the communities themselves, must be identified. The existence of Staff Development Days on the Academic Calendar presents an opportunity

to heighten awareness of ESN and vCoP amongst staff, and awareness sessions, including presentations, are designed for this purpose. One of the reasons why management support is a necessary prerequisite is that the necessary resources to develop the knowledge sharing environment can be put in place, and this includes training (Paroutis and Al Saleh, 2009; Mosha *et al.*, 2015).The provision of full training for communities in the use of ESN and how CoP work is necessary, as is training for community leaders in their roles as champions and facilitators. The training interventions include group training sessions, individual training and online, self-directed training.

2.3 AR Phase 3 – Action Taking

Action Taking, sees the implementation of the planned interventions over a specified period. According to Coghlan and Brannick (2014), in AR, data comes from engagement with participants in the AR cycles, so it must be acknowledged that data collection instruments themselves must be recognised as interventions. For this study, data is collected from focus groups, semi-structured interviews and content analysis, and the reasoning for the selection of these methods is presented in Paper 2 of this paper series. Following the assertion by Coghlan and Brannick (2014) that data generation in AR comes through active involvement in the day-to-day organisational processes relating to the AR project, it can be considered that data will be generated from participation in and observation of groups and individuals at work, problems being solved and decisions being made, and also from the interventions that are made to advance the project. Some of these interventions and observations are made in the formal context of the AR cycle design, but more are made in informal settings, through casual meetings and conversations, through emails, instant messaging and other forms of communication. Reflections on all of these occasions and occurrences need to be documented and this highlights the importance of reflective journaling in AR projects. These written records provide an important source of data for use within the study and can be used to supplement primary data from other sources (Jasper, 2005). The analysis of reflective writing may be approached in the same way as any other narrative data using techniques such as structured content analysis. However, Scanlan *et al.* (2002) suggest the adoption of a more holistic approach, using the journal data to influence the analysis of the data collected from other primary sources. As reflective writing generates data that reflects the researcher's interpretation of the topic, it serves to focus the researcher's analytical lens to provide a unique analysis of the total data set (Jasper, 2005). For this study, reflective journaling is being extensively used

to capture the researcher's interpretations of interventions and any events related to the project, and will use the holistic approach to using the data generated as per Scanlan *et al.* (2002).

The use of reflective journaling adds an extra dimension of rigour in so far as it provides an auditable trail of the research process. According to Jasper (2005), trustworthiness is enhanced when researchers document and interpret their experiences, and identify the events and situations that influenced their research decisions, thereby acknowledging their central role in the research process. By providing an additional data source, a reflective journal provides evidence to support the knowledge claims being made by the researcher. Koch (2006) refers to this process as the presentation of an audit trail which can be used to judge the dependability of the research. The reflective writing process also provides a transparent view of the research and demonstrates how the researcher has dealt with issues of subjectivity and potential bias. Coghlan and Brannick (2014) maintain that action researchers need to show that assumptions and interpretations are challenged continuously over a number of AR cycles through reflection so that the researchers familiarity with and closeness to the issues are exposed to critique.

According to Coghlan and McAuliffe (2003), an AR approach suggests that data gathering instruments need to be designed considering both the organisational setting and the purpose of the research. Any of these instruments in an AR project, whether surveys, interviews or focus groups, have to be considered as interventions, as the reception of these by participants can generate a range of emotional responses, all of which are real data for the researcher (Coghlan and Brannick, 2014). For example, interviewing cannot just be considered as a tool for collecting data, as asking a participant a series of questions is a data-generating intervention. Focus groups must also be viewed in the same fashion. Both focus groups and interviews are the primary data collection instruments for this study, but are being used to complement different cycles of the AR process. Focus groups are used during Cycle 1 and are drawn from the early communities that have emerged. This allows the accepted guidelines for focus groups to be met, such as group size being between five and ten participants, and that they are similar types of people. A focus group protocol sheet[11] has been developed to help in running focus group sessions, and includes a consent section for participants as well as a series of questions around the main research

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[11] See Appendix 1.

themes to guide the discussion. Focus group discussions are recorded (audio only) with the consent of the participants and the audio is transcribed and uploaded into the NVivo software analysis program. NVivo is a qualitative data analysis computer software package and is used by researchers working with very rich, text-based or multimedia information, where deep levels of analysis on small or large volumes of data are required[12]. According to Krueger (1997), the analysis process should begin while still in the group with the moderator probing for understanding as a result of participant' comments. Each focus group will be reported on and compared to other focus groups, comparing and contrasting results. Emerging themes will be looked for in relation to each question and then from an overall perspective. Topologies and diagrams of the analysis will be produced from the transcriptions and analysis in NVivo.

Semi-structured interviews will be used in conjunction with the second and third cycles of the AR process to gather detailed, in-depth information from participants. The results of the focus groups and reflective journaling analysis will be used as a basis to develop the questions for the interviews. Approximately six hundred staff at LIT make up the population of interest. A deliberate effort will be made to achieve a sample representative of the target population and include all stakeholders. Stratified sampling will be used to achieve this, with subcategories based on community members, ESN users and non-users, and staff categories of faculty, administration and support staff, and management. Population statistics will be derived from annual reports and used to obtain representative samples for each staff category, and these will be cross-referenced with user and non-user categories.

Content analysis will be conducted on the data in the ESN in conjunction with the second and third cycles of the AR process. According to Krippendorff (2012), content analysis is indigenous to communications research and is potentially one of the most important research techniques in the social sciences. Content analyses generally follow a number of steps that serve to define the technique procedurally. The first step is to design a framework for analysis, using a conceptual model, and by an initial exploration of the available data set. This is followed by identifying units of analysis in the volume of available data, such as words, phrases and themes. Coding is the step of classifying the recording units in terms of the framework for the analysis and is normally carried out by

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[12] See http://www.qsrinternational.com/what-is-nvivo for more information.

computer coding. Extracts from Yammer will be imported into NVivo for coding and analysis. The most important phase in content analysis is drawing inferences from that data. This is done by relating the theoretical knowledge of the conceptual model to the coded data. The content analysis in this study is used to evaluate the health of vCoP by examining the relevance of conversations, posts and comments to the community, and to triangulate the results with the data analysis from the focus groups and interviews to enhance the validity and reliability of the research.

When a number of research instruments form part of a study, triangulation can be used to ensure that the quality of what is gathered is robust and unbiased. Different instruments employed in qualitative research produce parallel datasets, each providing a different view of the whole picture. Richardson (1991) suggests that it is more useful to consider these views as complimentary rather than competing, and Mays and Pope (2000) support this view by concluding that triangulation can be used to "ensure comprehensiveness and encourage a more reflexive analysis of the data". According to Greenwood and Levin (2006), comprehensiveness is a more achievable goal for qualitative research than internal validity, which is the validity from the perspective of the group generating it or the participants in the research, and this is of particular importance to AR .

According to Loewenson *et al.* (2014), the nature of research is that any knowledge produced by it should be broadly applicable and results can be generalized. Validity requirements are as important in AR as in any other area of research but they cannot be evaluated in the same way. According to Koshy (2005), AR is a unique method for carrying out enquiries into different aspects of work practices and its purpose makes it different from large-scale research studies, but does not preclude the researcher from considering questions of reliability, validity and generalizability. Greenwood and Levin (2006) maintain that AR can and does produce valid and meaningful research results. Coghlan and Brannick (2014) describe rigour in AR as concerning the manner in which data is generated, gathered, explored and evaluated, and to how events are questioned and interpreted over the course of the study. AR uses a variety of data collection instruments that are used in traditional research, in this case, focus groups, interviews and content analysis. According to Koshy (2005), if these data collection instruments are applied using the same, strict standards as in other types of research, they should be equally as valid when used as part of an AR study. Furthermore, when used as part of an AR study,

data collection instruments must be recognised as interventions (Coghlan and Brannick, 2014). Table 3 lists the selected data collection instruments for this study.

Table 3. Data Collection Instruments

Data Collection Instrument	Source
Focus Groups	Krueger (1997); Krueger and Casey (2000).
Semi-structured Interviews	Myers and Newman (2007)
Content Analysis	Krippendorff (2012)
Reflective Journaling	Scanlan *et al.* (2002)

In terms of generalizability, action researchers do not set out to generate generalizable data, rather they seek to generate knowledge based on action within their own situation (Barbour, 2001; Koshy *et al.*, 2010). Greenwood and Levin (2006) describe how knowledge developed in one AR situation can be transferred to other situations by undertaking a collaborative analysis of the situation in which the knowledge might be applied. The results of a particular study will only be generalizable within that situation and within the context of the work. AR is only valuable if an exploration of the data for a particular change provides useful and interesting theory which contributes to the body of knowledge in the field under study. Whether the change process for the organisation is successful or not is of lesser concern (Coghlan and Brannick, 2014), for the researcher certainly, but perhaps not for the organisation. The undertaking of an AR project in the first instance reflects the intention of the researcher to bring about some change within the organisation in which it is being conducted. A good AR project will have some implications beyond those directly involved in it and it should have an explicit aim to extend or develop theory (Eden and Huxham, 1996).

2.4 AR Phases 4 & 5 – Evaluation and Specifying Learning

The *Evaluation* phase analyses the interventions to determine their effectiveness relative to the conceptual model. This phase involves a number of data analysis methods. In addition to analysing the data collected from the focus groups, interviews and content analysis, reflective journaling plays a central role. The final phase, *Specifying Learning* has slightly different aspects during cycles of the AR project than at the end. During the AR project, this phase will feed results into further diagnostics such that further actions may be planned for the next cycle of the project. At the end of the AR project, output

from this phase is presented to the organisation and the scientific community (Olesen and Myers, 1999).

3.0 Implementation and Initial Findings – AR Cycle 1 (Sep – Dec 2015)

The implementation of the interventions in Cycle 1 began in September 2015, coinciding with the beginning of the academic year, and the timeline of implementations is shown in Figure 4.

Figure 4. Timeline of Interventions and Data Collection for AR Cycle 1 (Sep – Dec 2015)
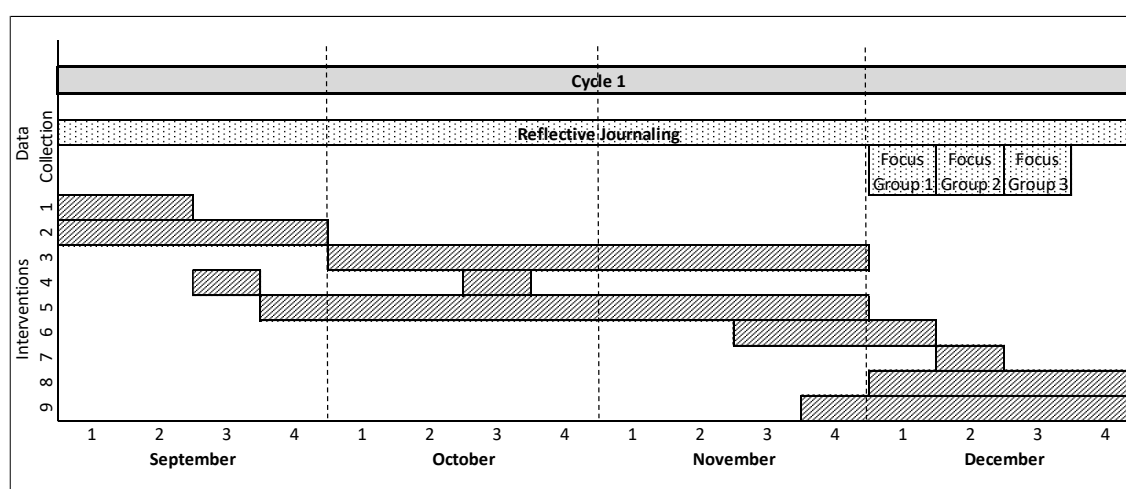
Management buy-in was prioritised and senior management were engaged at an early stage. A schedule of meeting and dates is presented in Table 4. The background to the project, the planned interventions and the potential participation of individual management personnel were all discussed in detail and approval for the project was achieved at the outset[13]. Although a number of senior managers have expressed interest in the possibilities that the use of ESN and vCoP offer to the Institute, very few of them have actively engaged with the ESN and the communities, with six joining communities and only four actively participating.

A selection of different social media tools was evaluated, including social networking tools, wikis, blogs and mail groups, against a number of criteria such as cost, usability, support and training requirements. A full list of documents that were analysed during this process is presented in Table 5. The main criteria was that any system had to be cost-neutral in its implementation as the Institute was not in a position to make a capital

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[13] Presented in Paper 2 of this paper series

investment in any new system. As part of the Office 365 suite supplied under a campus licence, Microsoft has included its ESN offering, called Yammer[14]. Yammer is a social network that's entirely focused on a business. It facilitates group conversation and collaboration and has many similarities to familiar social media tools such as Facebook and Twitter. These features make it a suitable tool to support vCoP and it was selected on that basis, and due to the fact that it was already available to LIT for use without incurring any additional cost.

Table 4. Schedule of Meetings

Meeting	Date(s)
Vice-President Corporate Affairs & Capital Development	18/09/2015
President	21/09/2015
Vice-President Academic Affairs & Registrar	28/09/2015
HR Manager	2 No. (Sep – Oct 2015)
IT Manager	6 No. (Sep – Dec 2015)
Head of Faculty of Business & Humanities	09/10/2015
Head of Faculty of Applied Science, Engineering & Technology	09/10/2015
Head of School of Art & Design	23/10/2015
Head of Academic Quality	23/10/2015
Student Affairs & Administration Manager	30/10/2015
Microsoft Ireland & UK Yammer Group (Dublin)	06/11/2015
Research Ethics Committee	2 No. (Nov 2015)

A portal to stage and advertise the communities was designed and built in conjunction with the Computer Services Department at LIT. This acts a collection point for all of the vCoP in the organisation, and allows users to see what communities are active, join communities or create new ones. Clicking on a community gives the user some information on the community, informs them who the moderator is, and how to join. An example can be seen in Figure 5. Email bulletins were issued to staff to inform them of the nature of the project and to seek expressions of interest for potential communities[15]. From the responses, a number of potential community leaders were identified and follow-up discussions held to determine if their ideas for communities were viable.

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[14] See: https://products.office.com/en-ie/yammer/yammer-overview for more information.
[15] See Appendix 2

Table 5. Overview of Documentation Analysed

LIT Documents	Yammer Documents and Resources	Other Documents and Resources
Vision & Strategy to 2020	Yammer Admin Guide (Microsoft)	Gartner Magic Quadrant for Social Software in the Workplace 2015
Interim Strategy Review 2015	Yammer AUP (University of Wisconsin)	Study: Why Most Online Communities Fail (sitepoint.com)
Annual Report 2013-2014	Yammer Developer Centre	Design Principles for Online Communities (UCLA)
IT Security Policy	Yammer Getting Started Materials	The University's collaboration tool gets sharper (University of Sydney)
Social Media Policy	Yammer AUP (Stony Brook University)	MWD Advisors' November 2014 Report on Social Collaboration (ibm.com)
Employee Handbook	Yammer AUP (Rose Bruford College)	The story of Intelpedia: A model corporate wiki. (socialmedia.biz).
Code of Conduct Policy	37 Ways MIT Uses Yammer (MIT Connect)	MediaWiki testimonials (mediawiki.org)
Computer Services Department Acceptable Usage Policy	Centre for Learning & Performance Technologies - Yammer	5 Secrets to Corporate Social Media Success (cio.com)
Policy on Dignity and Respect	5 Ways Yammer is Improving Communication, Connections, and Learning in our Schools (emergingedtech.com)	New Communication Methods: Aggregation and the use of social networking tools to foster new communication methods (University of Akron)
LIT Code of Ethics	It's Yammer time…(allthingsic.com)	Cornerstone Connect Datasheet (cornerstoneondemand.com)
Dignity and Respect Awareness Presentation	Yammer Customer Network: A Use Case For Yammer Communities (blogs.office.com)	Simply Smile – Putting social media into large enterprise (simply-goodadvice.com)
Continued Professional Development Policy	Communities in the making: Penn Staters come together through Yammer (news.psu.edu)	Why Jive-n: The Modern Intranet Where Employees Thrive? (jivesoftware.com)
	HAMK tackles the university challenge with SharePoint and Yammer (simply-communicate.com)	Considerations for implementing IBM Connections in your organization (ibm.com)
	Yammer Supporting Communication and Creativity at Wymondham, England, High School	IDC Forecasts Strong Growth in Enterprise Social Software Spending (cio.com)
	Yammer toolkit – Curtin University (curtin.edu.au)	Social Media in Communities of Practice (td.org)

Two criteria are used to assess the viability of potential communities. Firstly, they have to meet a number of the characteristics of communities (Wenger and Snyder, 2000; Wenger, 2011), and secondly, there has to be a number of members who have already expressed interest in participation.

Figure 5. LIT Communities Portal – Community Information Page
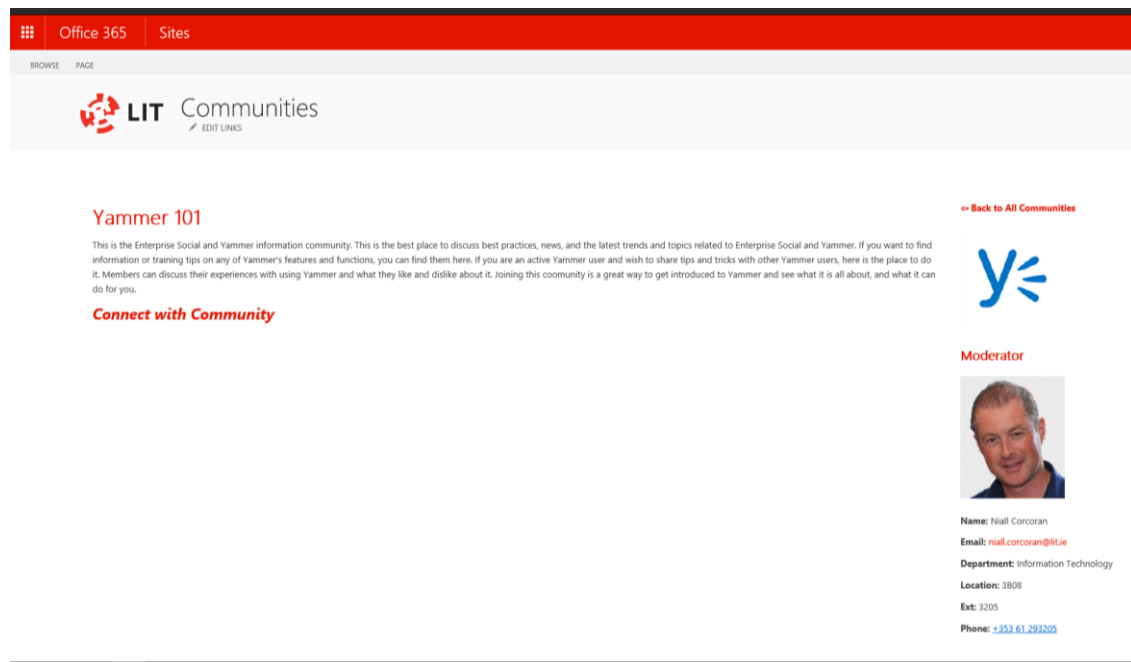
Some of the responses proved to be ideas for working or project groups rather than CoP, stemming from a lack of understanding of the purpose and nature of CoP. These respondents were encouraged to use Yammer to facilitate their groups but their ideas were not developed as CoP. The role of the community leader was discussed with respondents to ensure that they would be willing to assume the responsibilities of the role, and that they had a good understanding of the different aspects of the role such as organisation and facilitation (Kimball and Ladd, 2004). This process produced a number of viable communities, and these were setup on Yammer in conjunction with the community leader. Yammer has a feature called Groups that directly facilitates the hosting of communities online and provides an environment where they can have conversations, share files, post comments, etc. An example of a Yammer Group for a community can be seen in Figure 6.

LIT runs staff development days twice a year and, in September 2015, one of these was used to provide information and awareness on Yammer and vCoP. These sessions were well attended and generated some further interest, both in the idea of vCoP and Yammer.

Training on Yammer and how communities operate was provided for the CoP that were created and this included training for the community leaders. As the number of users and activity on Yammer increases, a number of ESN champions are being identified. These are typically high volume users who are immediately comfortable with using such systems and are seen as crucial to stimulate its growth and attract more users. These users are being engaged in order to create a more formal recognition for their role and to empower them to promote the ESN in the organisation.

Figure 6. Example of a Yammer Group for a Community of Practice
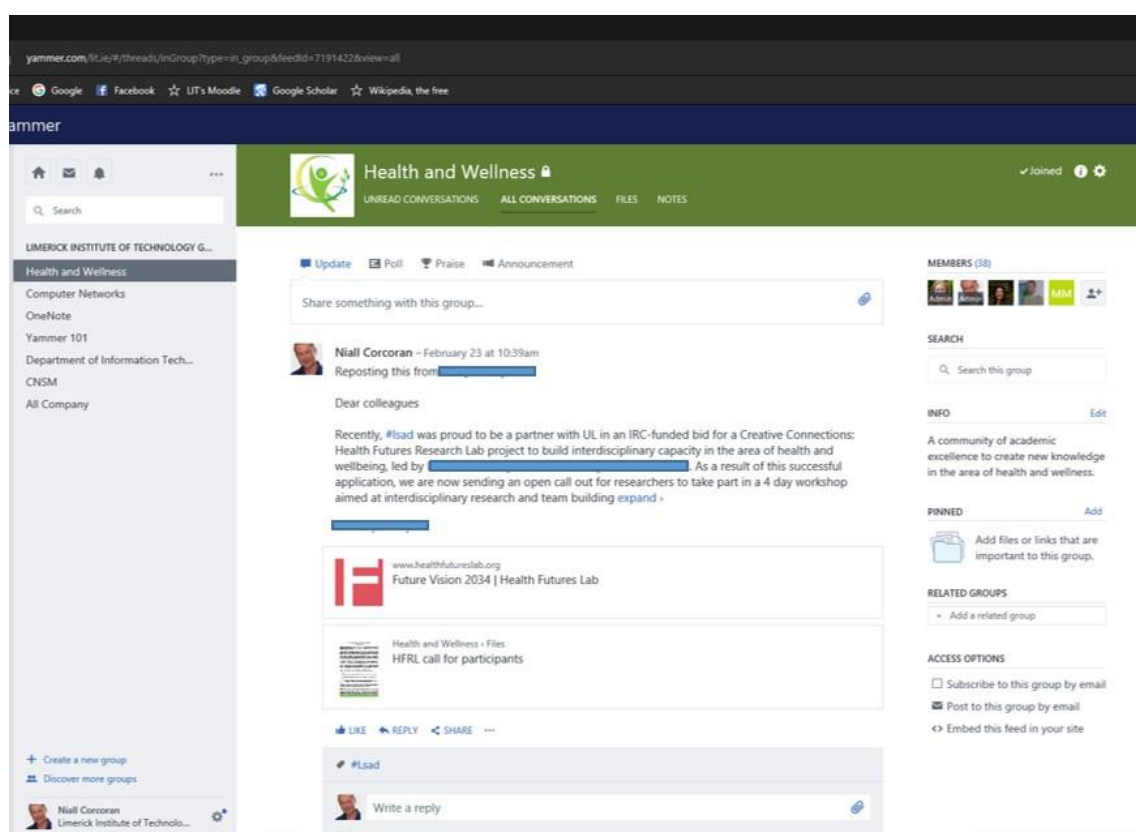
In line with the approach to the research set out in Figure 4, the data collection methods employed to coincide with Cycle 1 of the AR are focus groups and reflective journaling. Considering that the results of the reflective journaling process are used to enable a holistic view of the data from the primary data collection methods, the findings presented represent a combination of these methods When the focus groups are being carried out, participants are asked to fill in some details on the Participant Consent Form[16], including age range and length of service. These details are used to determine if generational gaps present in attitudes towards the use of ESN, and if length of service influences attitudes

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[16] See Appendix 2

towards CoP participation. The findings presented include data gathered from three focus groups conducted during December 2015, and a summary of the participants is given in Table 6. The focus group meetings were combined with training for communities and were therefore representative of the memberships of those communities. Each group consisted of five participants and included managers, academics, technical and administrative staff, with each session lasting approximately one hour. Outcomes from these focus groups are mapped to the research questions in Table 7 and also presented as a narrative.

Table 6. Focus Group Participation

Group	Participant	Role	Age Range	Service
1	A	Academic Manager	40-45	15
	B	Science Lecturer	40-45	6
	C	Social Science Lecturer	40-45	11
04/12/2016	D	Engineering Lecturer	40-45	13
55 minutes	E	Sports Lecturer	35-40	8
2	F	Engineering Lecturer	40-45	7
	G	Engineering Lecturer	34-40	7
	H	Education Lecturer	55-60	16
11/12/2016	I	Education Lecturer	55-60	17
67 minutes	J	Academic Manager	40-45	21
3	K	Service Manager	45-50	21
	L	Technician	35-40	16
	M	Technician	30-35	10
18/12/2016	N	Administration	35-40	12
48 minutes	O	Technician	30-35	10

Early analysis of the focus group data indicates that CoP are the key factor in staff participating in knowledge sharing activities and ESN are seen as a tool to facilitate them. Some participants had recent experience of CoP in the organisation and were positive in reflecting on their engagement with them. For example, Participant D stated that CoP participation "culminated in a few outcomes which we probably wouldn't even have thought of at the beginning" and "we did actually share a lot of knowledge outside of what we were doing as well, and it helped with teaching across different subject areas". It also led some participants (G, K, L) to feel that they "have a voice and can make choices", helping to "build a community for them" which otherwise would not exist. This was reinforced with a number of comments on the organisational structure and culture

inhibiting both knowledge sharing and sense of community. Group 1 as a collective felt strongly about this, with Participant A for example recognising that the "structure is very hierarchical and that in meetings people are afraid to speak up because of who is present and how what they are saying may be interpreted".

Table 7. Outcomes from Focus Group data mapped to RQs

Category	Outcomes
Antecedents for knowledge sharing	Yammer as a convenient environment
	Membership of a community
	Trust
	Positive and committed community leaders
Dominant problems associated with ESN implementation and vCoP participation	Organisational culture and structure
	Fear factors
	Lack of time, resources and interest
Key motivators for staff to adopt the use of ESN and participate in vCoP	Intrinsic motivators: enjoyable, interesting, stimulating.
	Reciprocity in sharing, making work easier and faster and ease of use
	Generating new ideas for courses and research
	Opportunity to get things done
Organisational and individual benefits	Creation of new knowledge and innovation
	Dissolution of boundaries and reporting lines
	Potential to change organisational culture
	Relationship building
	Enhancement of communications across the organization.

There was a feeling that the community could "be a trusting group" (D) and a "safe environment for academics and practitioners to actually discuss a topic that isn't very political" (A). Participant I spoke about "a great sense of siloing going on" and an inability to "harness that huge knowledge that exists across the place", and that participation in vCoP and using ESN is a "really big incentive" to change this, not just within the community but in the "much wider context of sharing knowledge and growing knowledge" in the organisation.

Relationship building was a benefit of participation in vCoP that a number of participants spoke about against the backdrop of organisational culture "not encouraging relationships to be built" (C). It was suggested that staff could get to know each other in vCoP and would also have the opportunity to engage with staff members, which they would not otherwise have had, so that when they meet in person, they "all of a sudden have

something to speak to a person about" (A). Others saw vCoP as having the potential to change the culture of the organisation, talking about the isolating nature of academic work - although lecturers are "inside in a room on your own with your students, and although you build up relationships, they are lecturer student relationships" (B). Using Yammer "seems like a nice thing – a familiar way of doing something" and can be used to "build relationships with people or even just familiarity" (C). The importance of using photographs in Yammer profiles was also mentioned in this regard (K, O).

Some of the intrinsic benefits of CoP participation were discussed, with a number of participants mentioning enjoyment, support and expanding interests. Participant J stated "one of the biggest reasons for me is the emotional outlet of being able to work on something that normally you wouldn't be able to - something that's enjoyable, something that we can enjoy doing", and Participant A that "I think that it also allows people to expand their original area of interest" and that the community "would allow people to come in and learn from the group very easily, and get support without having to try and find someone to ask a question". Indeed the benefits of having ready access to knowledge both through vCoP and the ESN drew some comments such as "this allows both academics and any staff to actually gain the knowledge or advice that they wouldn't normally get straight away (F)".

A number of participants saw Yammer as a significant way in which to enhance communications across the organisation, providing a "great opportunity to allow us to openly communicate with people who we would not normally see on a day to day basis" (A). This was tempered with the recognition that the ESN is merely a tool to facilitate communication: "Yammer is only the communication tool. It's not the community" (K). In terms of the community itself, the importance of combining face-to-face meetings with virtual communications was highlighted by some: "I think maintaining both the virtual and the face-to-face, certainly I think that you need to keep both going. That's important" (I).

A further theme that emerged from the discussions was the sense of being able to use CoP as a vehicle to get things done within the organisation with some participants citing the existing culture and structures as inhibitors to progress: "It's so hard to get something like that to work here. You end up banging your head against the wall for so long. You get nowhere"(C). It was felt that both individual and group initiatives could be achievable if

"you had the support of this community and it was promoted by this group" (A). Participant A also felt that CoP could be used as "vague umbrella headings" to promote initiatives or ideas that might not fit into existing structures, and people could say "I'm doing this as part of (CoP name) and all of these people are involved".

4.0 Summary and Reflections

The nature of AR dictates that further cycles of the process cannot be designed until the previous cycle has been completed and reflected upon. However, it is likely that the subsequent cycles for this project will include similar interventions as Cycle 1, but improved upon in their delivery as a result of the learning process that is central to AR. The interventions produced a number of positive and negative outcomes and these are listed in Table 8.

Executive management at LIT are very interested in the concept of both an ESN for the organisation and CoP as a knowledge sharing mechanism, recognising that there are a number of existing barriers to knowledge sharing activities, and that CoP might provide an alternative to bureaucratic structures. However, although executive management expressed considerable enthusiasm for the project, they have not subsequently engaged with it in any way. Given that management support is an antecedent for staff knowledge sharing, senior managers in the organisation need to actively use ESN and participate in vCoP to increase their chance of success. There has been some participation from middle management with a number of academic and service managers joining vCoP and using Yammer. Further engagement of management, with a view to increasing their participation, needs to be addressed in Cycle 2. A summary of proposed interventions for Cycle 2 is presented in Table 9.

The technical implementation of Yammer and the LIT Communities Portal was seamless and presented no problems, and users can join the ESN and navigate the groups with very little guidance. This indicates that are very few technical barriers to ESN implementation. The choice of Yammer as the ESN was guided by a number of factors including ease of use, market position and cost. However, the future of Yammer within Microsoft is uncertain and it may be fully integrated into the Office 365 platform. This would fundamentally change the user experience and may present an obstacle during the Contagion or Formalisation stages of the SOG model. The development path for Yammer will be investigated during AR Cycle 2 to plan for such an eventuality.

The first email bulletin seeking expressions of interest was well received and quickly elicited a number of promising responses. A second issue of the same email bulletin a number of weeks later resulted in a limited response. This may indicate a link between people who are already engaged technology users, demonstrated by a rapid email response, and people who have an interest in using tools such as an ESN for knowledge sharing. It may also be an indicator of the existence of the 90-9-1 rule (Nielsen, 2006), which proposes that, in any online participative system, 90% of people are lurkers, 9% are occasional contributors and 1% are regular contributors. More recent studies suggest that a 70-20-10 breakdown is achievable (Schneider, 2011; Hart, 2015), and further investigation of these targets will inform interventions for AR Cycle 2. A number of the respondents did not engage with the follow up process, mostly citing time constraints. However, all of them indicated that they would be interested in leading communities at some time in the future, and this will be addressed in Cycle 2.

The awareness and information sessions held as part of Staff Development Day were well attended, and staff found them engaging and seemed interested. However, these sessions were held on the main campus and limited to academic staff, excluding many interested parties from attending. Awareness and information sessions for other staff groups and other campuses are planned for Cycle 2. The sessions were held in computer rooms which allowed participants to engage with the ESN. Although this led to a number of new users on Yammer, most of these have not been active since joining, where activity is gauged through frequency of postings, comments and likes. This suggests that users need more than the availability of vCoP on the ESN to engage with it. .An attempt will be made to increase the user base in Cycle 2 by providing a range of functions on the platform that are not necessarily related to CoP, such as establishing support groups, working groups, department groups, and information feeds from different service departments such as the library, IT, sports, student services, facilities, etc.

Encouraging use of the ESN for non-work related activities, and adopting other facets of general social media use, are possible strategies to increase participation. Any fully functioning ESN is about much more than facilitating vCoP and the more alternative services that use it, the more users it will attract. Over time these users may become interested in the vCoP offerings and seek to join existing ones or create their own. This approach may also produce more ESN champions, as those identified during Cycle 1 are already community leaders and fulfilling the champion's role.

Further training on CoP and Yammer was provided to three of the communities, with additional instruction provided for the community leaders on their role within the community. The remaining communities, through their leaders, did not engage with the training process, citing time constraints. These communities will be trained during Cycle 2, and training in CoP and Yammer will be ongoing and provided at individual and group level, with training materials also accessible on Yammer. Although potentially every staff member in LIT was made aware of the existence and purpose of Yammer through email, further promotion of the ESN as a valuable communications tools for staff is necessary. An awareness campaign will be central to Cycle 2 and will include emails, advertisements on information portals, use of digital signage, and running events on Yammer itself, such as Webinars and live training sessions. Further interventions in Cycle 2 will be designed to make the ESN more engaging for staff and a place to go to find information. The role of CoP within the organisation will be further explored with management and the possibility of having a number of mandated CoP will be investigated.

Table 8. Cycle 1 Interventions and Outcomes

No.	Intervention	Positive Outcome	Negative Outcome
1	Attain executive management backing for the project.	Support and approval obtained. A number of middle management have joined the ESN and vCoP.	No engagement from executive management with ESN or vCoP.
2	Investigate ESN tools and select for implementation.	Microsoft Yammer selected.	The future of Yammer within Microsoft is uncertain and it may be integrated with Office 365, which could change the user experience.
3	Design and build portal for vCoP.	LIT Communities Portal built. Users can browse and join existing vCoP from a central location with minimal guidance.	The portal needs more vCoP listed to make it more attractive to potential users. It also needs to be active.
4	Seek expressions of interest for CoP (email and follow up)	15 expressions of interest received.	Most received in first call and very few in second, indicating that saturation was reached quickly.
5	Identify potential community leaders.	10 potential community leaders identified.	Not all of the original respondents engaged with follow up.
6	Build vCoP on ESN with community leaders.	7 vCoP setup with Yammer Groups.	The concept of vCoP may not be well understood.
7	Hold awareness sessions for staff (Staff Development Day).	Sessions held on 10/12/2016 with good attendance and positive feedback.	Limited to academic staff only and one campus.
8	Provide training for CoP and community leaders.	Training provided for 3 vCoP and their leaders. These vCoP are subsequently more active than others.	The remaining vCoP, through their leaders, have not engaged with the training process, citing time constraints.
9	Identify ESN champions.	Ongoing, with a number identified.	Generally limited to community leaders.

Table 9. Proposed Interventions for AR Cycle 2 (Jan – Apr 2016)

No.	Intervention
1	Further engagement of management, with a view to increasing participation, especially at executive level.
2	Investigate Microsoft development path for Yammer.
3	Follow up with potential community leaders identified from Cycle 1.
4	Awareness and information sessions for all staff groups at all campuses.
5	Provide additional functionality on ESN external to vCoP, such as support groups, working groups, department groups, and information feeds.
6	Identify ESN champions that are not community leaders.
7	Provide training for CoP and community leaders that were not included in Cycle 1.
8	Provide training and support at individual and group level, with training materials accessible on Yammer.
9	Conduct an awareness campaign to include emails, advertisements on information portals and digital signage; Webinars and live training sessions.

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Appendix 1: Focus Group Protocol Sheet

A Study to Investigate How Enterprise Social Networks Can Enable Staff Knowledge Sharing in Virtual Communities of Practice in Higher Education.

Focus Group Protocol

Meeting Data

Date:			
Time:	Start:		Finish:
Location:			
Moderator:			
Community Name:			

Participant Data

Name	Job Title	Age Range	Length of Service

Introduction

My name is Niall Corcoran and I am undertaking a structured DBA programme through the School of Business at Waterford Institute of Technology. I am also a lecturer in the Department of Information Technology at LIT, and I previously held the post of IT Manager at LIT.

Purpose of Research

The objective of the research is to investigate how enterprise social networks (such as Microsoft Yammer) can enable staff knowledge sharing in virtual communities of practice in LIT. The research explores the antecedents for staff knowledge sharing in an ESN vCoP environment and the dominant problems associated with an ESN vCoP implementation are also determined. It also examines the key motivators for staff to adopt the use of ESN and participate in vCoP, and looks at the perceived benefits of knowledge sharing from both organisational and staff member perspectives.

Focus Group Structure

This focus group is to seek your perceptions about the three main research themes in the study: organisational knowledge sharing, enterprise social networks and communities of practice. All contributions are highly valued and all opinions are valuable, even if you feel that they may be negative. Your comments and opinions will be strictly confidential. The session will be recorded and notes will be taken so that the researcher can report your opinions accurately. Your comments will be combined with those from other meetings for analysis and reporting. Please see the Participant Information & Consent Sheet for further information.

Roundtable Introductions

Only necessary if the participants are not known to each other or to the researcher. If required, just name and function.

Focus Group Themes and Questions

The themes for the focus group will be displayed in a table on screen if one is available, to maintain focus. If participants are reluctant to begin talking, use specific prompts.

Pose the first few questions directly to one or more participants until they become comfortable with the process.

Theme A: <u>Knowledge Sharing</u>

Q1: What is your definition/understanding of a "knowledge-sharing" culture? How would you recognize one?

Q2: Would you say that there is a knowledge-sharing culture within LIT?

Q3: What are the benefits of a knowledge-sharing culture?

Theme B: <u>Communities of Practice</u>

Q1: What is your definition/understanding of the term communities of practice?

Q2: Are you aware of any existing communities and are you (or have you ever been) a member of one?

Q3: Do you think communities of practice would be beneficial to you and to LIT?

Theme C: <u>Enterprise Social Networks</u>

Q1: Do you think that having an LIT social media platform for staff knowledge sharing would be useful? Would you use it?

Q2: Do you have concerns about using social media such as security and trust issues?

Q3: Are there other reasons why you would not use such a system at work?

Conclude by asking if there are any other issues that participants wish to raise. Reiterate the points on anonymity and confidentiality and thank all participants.

Appendix 2: Participant Information and Consent Sheet

A Study to Investigate How Enterprise Social Networks Can Enable Staff Knowledge Sharing in Virtual Communities of Practice in Higher Education.

Participant Information & Consent Sheet

What is the project about?

The implementation of social media for knowledge sharing in the corporate arena, generally referred to as enterprise social networking (ESN), is gaining pace, largely due to social media bearing many similar characteristics to a knowledge management (KM) technique known as communities of practice (CoP). However, the management of organisational knowledge and the promotion of staff knowledge sharing in higher education institutions (HEIs) has been largely neglected, with low levels of KM implementation in these organisations. The same pattern is emerging with ESN, and social media use is generally confined to marketing activities. This project involves the implementation of a Communities Portal and the use of Microsoft Yammer as an ESN in virtual CoP (vCoP). The research seeks to investigate how ESN can enable staff knowledge sharing in vCoP in Limerick Institute of Technology (LIT).

Who is undertaking it?

My name is Niall Corcoran and I am undertaking a structured DBA programme through the School of Business at Waterford Institute of Technology, under the supervision of Dr Aidan Duane. I am also a lecturer in the Department of Information Technology at LIT, and I previously held the post of IT Manager at LIT.

What are the benefits of this research?

A practical contribution is the creation of a Communities Portal for LIT and the introduction of ESN tools to facilitate an environment for the establishment of vCoP and organisational knowledge sharing. Limited research has been conducted on applications of social media as a knowledge management tool in organisations, and especially in higher education. In seeking to determine the drivers and barriers to sustainable use, this research should be of interest to practitioners and researchers undertaking similar projects. The study findings will also provide an opportunity for educationalists to better understand the scope and the impact of employing ESN platforms for staff knowledge sharing.

Exactly what is involved for the participant (time, location, etc.)

A number of data collection methods are being used as part of this study: content analysis, focus groups and semi-structured interviews. By agreeing to participate in the study, you are making your posts on Microsoft Yammer available for content analysis by the researcher. It should be

noted that posts will be completely anonymised prior to analysis and no personal data of any nature will be included. The content analysis will involve key word searches to determine relevance of postings to communities. A number of focus groups will be established from communities and these will be held in conjunction with training on vCoP and Microsoft Yammer. Semi-structured interviews will also be carried out with a number of staff members who will be selected using stratified sampling.

Right to withdraw

Your participation in this study is entirely voluntary, and even if you agree to participate, you may withdraw at any time. It should be noted that by using LIT's Microsoft Yammer, your posts may be used for content analysis. However, the content of the posts will not be read or examined other than undergoing keyword searches. Content will be extracted from Yammer without any personal data so the author of posts will not be included in the data collection. If you do not want your Yammer posts extracted from the system for analysis, then simply email the researcher at niall.corcoran@lit.ie advising of same, and your posts will be excluded from the analysis. If you are asked to participate in Focus Groups and/or Interviews, and do not wish to do so, simply decline at that point. If you do agree to participate, you can also withdraw your consent at any time, either during or after the focus group and/or interview.

How will the information be used / disseminated?

The data collected from all methods will be combined with that of the other participants in this study and used to form part of the results section of the thesis. Aggregated data only will appear in the thesis and individual participant data will not be shown, apart from selected quotations for illustrative purposes, and these will not be attributed to individuals or organisational positions, other than faculty/support staff/management/etc. The focus group and interview data will be coded and analysed using computer-assisted qualitative data analysis software. All the necessary procedures will be followed in order to ensure your anonymity, confidentiality, and personal integrity in the process. All participants will be entitled to access any transcript or other data relating to them as per Data Protection legislation, and the results of the study will be available to all participants on request.

How will confidentiality be kept?

The case site (LIT) will be detailed as part of the study so it will not be possible to offer institutional anonymity. However, your personal anonymity is guaranteed and forms no part of the data analysis or findings, which will be reported in such a way that individuals cannot be identified.

What will happen to the data after research has been completed?

In accordance with the WIT Record Retention Schedule, all research data will be encrypted and securely stored for the duration of the project plus five years. No other person will have access to the data apart from the researcher and the data will not be used for any other purpose other than that which is expressly stated, in line with the Data Protection Acts of 1998 and 2003.

Contact details:

If at any time you have any queries/issues with regard to this study my contact details are as follows:

Consent:

By signing hereunder, I consent to participate in a focus group and/or interview which is being conducted as part of this research project. I am aware that audio content of these sessions may be recorded.

_____   _____

Participant   Date

Focus Group Consent

Date:	Location:		
Name	**Signature**	**Age Range**	**Service**

Appendix 3: Email Bulletin Issued to All Staff

From: Niall Corcoran

Sent: 18 September 2015 13:48

To: AllStaff <AllStaff@lit.ie>

Subject: LIT Communities Portal

Dear Colleague,

Early in the New Year, a new initiative is being rolled out across LIT which involves the use of online tools to facilitate the creation of virtual communities of practice. Communities of practice are described as groups of individuals linked together by their enthusiasm for sharing and expanding their knowledge, typically in informal settings and arrangements. The aim of this project is to facilitate knowledge sharing and collaboration amongst LIT staff, across departments and campuses, through the use of enterprise social networking tools. Microsoft Yammer, which is already available through the Office 365 platform, will be the main enterprise social networking tool for this project, which may also see the introduction of wiki and blogging tools as it progresses.

The communities of practice will be accessible through a Communities Portal where staff will be able to see details of existing communities, join active communities, and learn how to create their own communities. Participation in any community is entirely voluntary and community members may join, leave or participate as they so wish. Communities are intended to be related to LIT operations and must comply with the LIT Communities Acceptable Usage Policy, which will be published in conjunction with the launch of the Communities Portal.

To begin the project, the establishment of a number of possible communities are being considered, in the areas of campus planning and development, student support, LIT Sports, Moodle users, and pedagogical skills. Please note that these are just some examples and the creation of any community will be considered if interest and support is there for it. Any suggestions for potential communities are very welcome.

It should be noted that this initiative forms part of a Level 10 research project which will involve the use of focus groups and interviews as data collection methods. Participation in any of these activities will be entirely voluntary and any data collection will be completely anonymised and strictly dealt with in consideration of all relevant legislation and ethical issues.

If you have any questions in relation to this project, please do not hesitate to contact me.

Kind regards,

Niall Corcoran.

Niall Corcoran

Lecturer, Department of Information Technology

Limerick Institute of Technology

Moylish Park, Limerick, Ireland.

Tel: +353 61 293205

Paper 4

Investigating Staff Knowledge Sharing in an Irish Higher Education Institution through Action Research: Findings

Preface

The development of the findings paper took place between May 2016 and September 2016, when it was presented for external examination at WIT, and recommended without review, and this version is presented here. The structure of the DBA research paper series provided the option of presenting the findings and discussion in paper four of the series, or limiting this paper to the findings only. Given both the timeline of the AR project and the need to present the qualitative findings as a narrative, only an account of the implementations of Cycles 2 and 3, and the research findings are presented in this paper. The findings are presented in the most effective and concise manner possible, and in keeping with the AR methodology. The discussion is confined to Section 3.

One noticeable difference in this paper relative to the other papers in the research paper series, is the use of the first person narrative, and this was the first time that I attempted to use this style in my writing. I had been strongly encouraged to do so by one of the examiners at the examination for Paper 3, but I was reluctant to take up this approach. As an engineer, I have spent all of my educational and working life producing technical reports and documentation, all of which are invariably presented in the third person style. As an educator, I always instruct my own students to never present any material in the first person and train them in writing in the third person. However, despite my reluctance, I began to investigate the use of the first person narrative in academic research and found that it is becoming an accepted style in certain research fields, such as phenomenology and ethnography (Wertz *et al.*, 2011). According to Billig (2013), critics of the first person narrative claim that it greatly reduces the professional tone of the material, introducing tones of subjectivity that reduce the scientific merit of the presentation. However, writing strictly in the third person completely excludes the researcher from the narrative and they effectively disappear from the text. In the case of AR, which is normally conducted by individual researchers or a team of researchers who are an intrinsic party of the research process, their experiences are central to the research journey itself, and if they are not a visible part of the research narrative, then it may be difficult for the reader to interpret their roles in the AR interventions and their analysis and interpretation. Writing up AR research in a formal, third person narrative style, could lead to the use of what Bryman (2015, p.682) describes as "torturous sentences", and he welcomes the growing acceptance in the research community of the researcher appearing in the text. I was eventually convinced that writing in the first person would be an acceptable convention

for the presentation of this research, but I also adopted a somewhat cautionary approach from Saunders *et al.* (2011), who suggest that excessive use of first person pronouns may cause readers to question the ability of the researcher to stand back from their data and be objective.

I had attributed some importance to the development of a stages of growth (SOG) model from the outset of the research. For example, Paper 1 concludes that existing models may not be sufficient to guide the ESN implementation in my research project and a consequential aspiration is to develop a SOG model for the purpose of implementing social media tools for knowledge sharing in HEI contexts. However, as the AR project progressed, it became apparent that the necessarily short time frame in which it was being conducted, meant that the progression of the ESN within the organisation was not going to progress much beyond the *Initiation* phase of the model from Damsgaard and Scheepers (2000), which I was using as a guide for the implementation. Therefore, I decided to dispense with this aspiration to develop an adapted SOG model which could be used by other organisations to manage similar implementations, and this is reflected in the revised research objectives which are listed in the introduction to this paper. The revised objectives are simply a combination of the original research questions with the integration of their practical applications in the AR project, and serve to highlight the dual aspects of practice of research which are common to AR projects, but are also a typical facet of DBA projects where there is a focus on practitioners investigating organisational problems through research.

Semi-structured interviews were the main data collection instrument used during the AR Cycles 2 and 3, moving on from focus groups which were used during Cycle 1 and reported on in Paper 3. I found the focus groups to be a useful exercise and they produced rich data from the interaction between group members. My strategy was to use the focus groups to prove the validity of the key themes for the data collection (Table 1), and to use the data from the focus groups to develop a refined set of questions for the semi-structured interviews. This strategy worked well in practice and I was able to manage the themes through a logical progression in the focus groups, and improve on this for the semi-structured interviews, so that they became close to a natural conversation, providing for further sources of rich data. I was also able to approach the interviews with a degree of confidence that participants would be willing to engage on the key topics and that I was not addressing any sensitive issues that might present ethical dilemmas.

Table 1. Focus group and interview topics

Research Theme	Focus Group and Interview Topics
Knowledge Sharing	Current levels Willingness and desire to share knowledge Perceived barriers to sharing knowledge Perceived advantages of sharing knowledge
Communities of Practice	Awareness of concepts Awareness and examples of existing communities Perceived usefulness of communities
Enterprise Social Networks	Usefulness of enterprise social networks Trust and security issues Barriers to using enterprise social networks

According to Myers and Newman (2007), the qualitative interview is the most common and one of the most important data gathering tools in all kinds of qualitative research, whether positivist, interpretive or critical; it is used in case studies, in action research, in grounded theory studies, and in ethnographies. Rubin and Rubin (2011, p.vii) liken interviews to night glasses, "permitting us to see that which is not ordinarily on view and examine that which is looked at but seldom seen". Fontana and Frey (2000) describe interviews as interactional encounters in which the nature of the social dynamics of the interview can shape the nature of the knowledge generated. They describe a continuum model, with structured interviews at one end, through semi-structured interviews, to unstructured interviews at the other end of the continuum (Fontana and Frey, 2000). The aim of structured interviews is to ensure that each interview is presented with exactly the same questions in the same order, and are used primarily as a means of collecting data for statistical surveys. Unstructured interviews tend to be more informal and free flowing than a structured interview, much like an everyday conversation, and are normally used for more sensitive subjects, allowing more complex issues to be probed. A semi-structured interview is open, allowing new ideas to be brought up during the interview as a result of what the interviewee says, with the interviewer generally having a framework of themes to be explored. I rejected structured interviews for this study because they could have minimised the opportunity for variability and development of discussions. I also rejected unstructured interviews because they would be too open ended, and would not be helpful in answering the research questions. I settled on a semi-structured interview approach, so that the same questions could be asked of all participants, but I built in some flexibility to develop lines of enquiry that might be particularly relevant to exploring emergent themes.

I selected the sample population for the semi-structured interviews using a combination of stratified and purposeful sampling. Given the total population that was available, the selection of a sample that was representative of the total but also included all stakeholders, and was most likely to provide useful data, was problematic. According to Marshall (1996), the probability sampling techniques used for quantitative studies are rarely appropriate when conducting qualitative research. Although studying a random sample provides the most efficient way to generalize the results to the overall population, it may not be the most effective way of generating the required understandings when studying human behaviours. Samples for qualitative studies tend to be small, increasing the chances of bias. Furthermore, in an AR study it is likely the researcher will be able to identify certain people who are more likely to provide insight and understanding, and it is therefore desirable to select interview subjects on that basis. Marshall (1996, p.523) claims that selecting a subject at random to answer a qualitative interview question is analogous to "asking a passer-by how to repair a broken down car, rather than asking a garage mechanic". The most common sampling technique for qualitative studies is judgement or purposeful sampling, where the researcher actively selects the most productive sample to answer the research questions (Marshall, 1996).

In the development of both communities, specifically vCoP in this research, and ESN, there are two roles which are attributed a significant level of importance. These are community leaders and champions, with the latter also applying to ESN, and both appear a number of times in this paper. For a more complete understanding of these roles, more detail is provided here. According to Hart (2015), the community leader is a key factor in the success of the community and fulfils a number of different roles, including change agent, trainer, content curator, connector, brand ambassador and consultant. They will be heavily involved in all the initial stages of the community cycle, planning and launching, but will also have a major part to play in the daily running of the community. Because of the varying activities required of the community leader, the person who takes on this role will need a wide range of skills, including communication, an understanding of human behaviour and motivations, relationship building, conflict resolution, and some technical abilities to lead vCoP.

The strength of any network is determined by the strength of people participating in it, and, in addition to leaders, the role of champion is also a crucial one. There are always individuals in any organisation who take a keen interest in everything, including new

technologies and initiatives, and are the most likely to participate and encourage others to do so. If these individuals see the value in something, then they will use it and be strong drivers of its growth and assimilation into the organisation. Coakes and Smith (2007) maintain that champions will be found amongst the *Innovators* and *Early Adopters* identified by Rogers (1995), and are catalysts for intermittent and ongoing knowledge sharing efforts. In most mature organisations, these champions will have the ability to place other staff into the five categories proposed by Rogers (1995), and thereby seek to share knowledge with pragmatists who they can readily identify. Without this insight, knowledge sharing efforts will invariably be hampered as champions will inevitably meet with the *Late Majority* and *Laggards* and have their efforts thwarted (Coakes and Smith, 2007). According to Howell and Higgins (1990), champions tend to have been with the organisation for a long time, with experience of multiple domains within it, and also have in-depth knowledge of their industry.

Some authors have compared champions to transformational leaders (Tushman and Nadler, 1986; Stata, 1989), who play a key role by bringing people together through promoting vision and trust. According to Day (1994), they have an ability to navigate through the political and social organisational environment, an ability that is especially important in politically charged organisations such as public HEIs (Rowley *et al.*, 1997). Although people tend to be more creative when they are motivated by interest, satisfaction and challenge, and champions are usually intrinsically motivated by virtue of their character (Howell, 2005), they should be recognised for their contributions and management should be supportive of their activities. Champions operate through strong social networks and these networks are crucial in delivering the success of new initiatives such as an ESN (Jenssen and Jørgensen, 2004). A challenge for organisations is therefore, to identify potential champions and their social networks, and to how to use them to foster the growth of ESN and vCoP. In the development of the ESN, champions should be identified at an early stage and invited to participate. They help to resolve any initial problems and drive the increase of the user base. It is useful if the ESN champions are drawn from a spectrum of people from across the organisation, including a mixture of early adopters, socially savvy people, contributors, spectators, key users and executives.

As the use of ESN and collaboration platforms gains traction in organisations, there is a growing need for the management and support of these platforms, not just from a technical perspective, which should be the role of the IT services department, but from

human and social aspects, and how they are used effectively within the organisation. The practice of managing an entire enterprise community is still emerging, but it is one that is much wider than just supporting one small team or CoP within an organisation, and involves having responsibility for building and sustaining a community spirit across the whole organisation (Hart, 2015). For organisations that adopt community models and ESN as part of their strategic development, roles such as community leaders and enterprise community managers will have to become established for these initiatives to be successful, and large organisations will probably have to create positions for these roles who will work alongside the IT department as well as all departments and functions in the business.

The package of interventions that is presented in Table 6 of the paper, provides a useful set of guidelines to continue the growth of the communities model and the ESN within the organisation, and also provides a good starting point for a further AR cycle if it is possible to extend the research or begin a new research project in this area. The content of this and the other papers in the research paper series has provided the basis for a number of conference papers and pending journal papers (for example, Corcoran and Duane (2016a) and Corcoran and Duane (2016b), and may lead to further opportunities to continue to explore the findings of this study and build on the conclusions from it.

Abstract

This study is focused on a 12 month Action Research project to design, implement and manage a knowledge sharing environment for staff in a higher education institution (HEI), with a formal objective of examining how enterprise social networks (ESN) can enable staff knowledge sharing in virtual communities of practice (vCoP) in higher education. The practical goal of the project is to implement a knowledge sharing environment in the host organisation and promote the development of communities of practice. The conceptual model proposes that there are low levels of staff knowledge sharing in HEIs, and that the implementation of an ESN, and the promotion and support of its use in vCoP, will enable staff knowledge sharing activities, providing a number of individual and organisational benefits. The research questions, developed from the conceptual model, are framed to examine the antecedents for staff knowledge sharing, investigate and manage the dominant problems associated with staff participation in virtual communities of practice, explore what motivates staff to participate, and what the organisational and individual benefits of increased staff knowledge sharing activity are. Continuing from Cycle 1 of the AR project, Cycles 2 and 3 produced further packages of interventions. The main data collection instrument during these cycles was semi-structured interviews, underpinned by reflective journaling and content analysis. The basis for the research, the existence of a divide between academic and other staff and a resultant lack of interaction and communication, is well supported by the data. In addition, all of the inputs and outputs of the conceptual model are supported by the data, with a number of additional findings also emerging, which can be used to enhance the model, indicating that it can be used to conceptualize the creation of a knowledge sharing environment in a HEI.

1.0 Introduction

This study is centred on an Action Research (AR) project to design, implement and manage a knowledge sharing environment for staff in a higher education institution (HEI). The formal objective is to examine how enterprise social networks (ESN) can enable staff knowledge sharing in virtual communities of practice (vCoP) in higher education. The knowledge sharing environment is constructed around vCoP underpinned by an ESN tool, and is based on a conceptual model developed at the outset of the project. The main focus of the 12 month AR study is to examine a number of research questions

that have been developed from an analysis of the initial problem diagnosis, the literature and the resulting conceptual model. Given that AR projects generally have dual aspects of practice and research (Coghlan and Brannick, 2014), the associated objectives of the project are to:

1. Implement a knowledge sharing environment in the host organisation and promote the development of communities of practice;

2. Explore the antecedents for staff knowledge sharing and apply them to the knowledge sharing environment;

3. Investigate and manage the dominant problems associated with the implementation of ESN and participation in vCoP;

4. Determine the perceived benefits of knowledge sharing for both the organisation and for staff members;

5. Understand what motivates staff to adopt the use of ESN and participate in vCoP.

As the action researcher for this project, I[17] have dual roles in this study. At the outset of this project, I held the position of IT Manager at Limerick Institute of Technology (LIT) and initiated the process of creating the knowledge sharing environment through the consideration of a number of ESN tools and the introduction of one of these, Microsoft® Yammer®, to facilitate online staff conversation and collaboration. LIT is the fourth largest IoT and the eleventh largest of the 21 public HEIs[18] in Ireland, indicating that it is a valid representative sample to apply generalizability to the conclusions drawn from this study.The other role that I have in the project is that of researcher, carrying out this study as part of the professional doctorate programme at Waterford Institute of Technology.

The conceptual model proposes that there are low levels of staff knowledge sharing in HEIs, and that the implementation of an ESN in LIT, and the promotion and support of its use in vCoP, will enable staff knowledge sharing activities, providing a number of individual and organisational benefits. However, there are a number of barriers to organisational knowledge sharing that are prevalent in HEIs, such as their unique structures and cultures, which have led to a general lack of adoption of knowledge

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The first person narrative is an accepted convention for reporting the findings of AR projects and will be used throughout this paper (Todres, 2007; Wertz *et al.*, 2011).

[18] HEA Statistics 2014-15: Available at http://www.hea.ie/node/1557

management initiatives (Fullwood *et al.*, 2013). This is highlighted in LIT by the Intranet system or Staff Portal, which was designed as an information repository in the early 2000s. Use of the Staff Portal remains low and most users simply use it as a gateway to access other applications such as timetabling and payroll. The Staff Portal was an initiative of the Computer Services Department and was never promoted as on organisational tool by management, and especially by middle management, with some exceptions.

Although the potential organisational and individual benefits to having a successful and vibrant knowledge sharing environment are significant, a number of individual barriers to using knowledge management tools are identified in the conceptual model, including fear factors, time and interest constraints, and generational gaps. This study seeks to determine if management and staff are committed to overcoming the barriers to knowledge sharing in order to realise those benefits. An important aspect of the findings will be the influence of the key motivators, previously identified in the conceptual model, to use an ESN and participate in vCoP on the actual participation rates.

This paper is presented as a continuation of Paper 3, which reported on a series of interventions for Cycle 1 of the AR project and the analysis of the focus group data. This analysis produced a proposed set of interventions for Cycle 2, which are presented in Table 2 (p. 8). Some practical elements of the data collection process are introduced, including the structure of the sample population leading to the selection of interview participants, and a brief description of the interview process. The development and implementation of the interventions packages for Cycles 2 and 3 are described, along with positive and negative outcomes. The key findings from the analysis of the data are presented as a narrative followed by reflections on the data collection and analysis. This is a consideration of my role as an action researcher, with particular emphasis on my interaction with participants during the data collection process, and a consideration of some of the limitations that I encountered, and how these were addressed. The paper finishes with a summary of how the findings will be discussed in Section 3 of the DBA thesis.

2.0 Data Collection

The AR project consists of three cycles, each of four months in duration, spanning 12 months in total. Focus groups were the primary data collection instrument used in Cycle

1 and these findings were presented in Paper 3 of this paper series. Semi-structured interviewing was the primary data collection instrument used for Cycles 2 and 3 and an analysis of this data is the primary source for the findings presented in this paper. Reflective journaling was used extensively throughout the AR cycles in order to capture my interpretations of the interventions for each cycle, and also to capture informal conversations, observations, and anything else to do with the project. Whilst much of the reflective journaling was used to focus my analytical lens in analysing the total data set as per Scanlan *et al.* (2002) and Jasper (2005), I adapted a reflective analysis technique from Gibbs (1988). This technique uses six distinct stages to assist in structuring reflection on learning experiences, and I used it to provide a structure to the reflective journaling process which could be mapped to the individual phases of each AR cycle, and also to provide a more detailed analysis of my reflective journaling. The content of a number of conversation threads from the ESN was also analysed to determine the depth of engagement of staff with particular communities.

2.1 Sample Population

The sample population is the staff at Limerick Institute of Technology. According to LIT's Annual Report for 2013/2014[19], the total number of staff at the Institute was 603, divided into 359 academic staff and 244 support staff, representing a 60/40 percentage split. Access to LIT's Yammer environment is controlled by corporate email accounts. Staff members are free to join the Yammer environment on a voluntary basis, and the main motivation to do so is to join one of the established vCoP on Yammer, which are advertised through the LIT Communities Portal (see Paper 3). At the completion of the AR project, 209 members of staff had established accounts on Yammer, representing 35% of the total population. The rate of growth of Yammer users over the course of the 12 month AR project is shown in Figure 1. This displays an initial slow-growth period during the start-up phase of Cycle 1, followed by a higher rate of growth during Cycle 2, and a tailing off in growth during Cycle 3, which coincided with the summer recess from mid-June to the end of August.

In selecting subjects for interview, I made a deliberate effort to achieve a sample that was representative of the target population, whilst including all stakeholders at the same time. I attempted to do this by using a combination of stratified and purposeful sampling,

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[19] LIT Annual Report 2013/14: Available at http://www.lit.ie/Reports/default.aspx

initially applying the principles of stratified sampling to the original staff population of 603. I chose a sample size of 30 interview subjects, which represents 5% of the total population. I determined two strata of academic and support staff and allocated populations of 18 and 12 respectively, matching the 60/40 breakdown. Rather than then apply simple random sampling to these strata, I applied further criteria to these populations to ensure that all stakeholders were included, and I used purposeful sampling for this.

Figure 1. Rate of Yammer User Growth (Sept 2015 – June 2016)
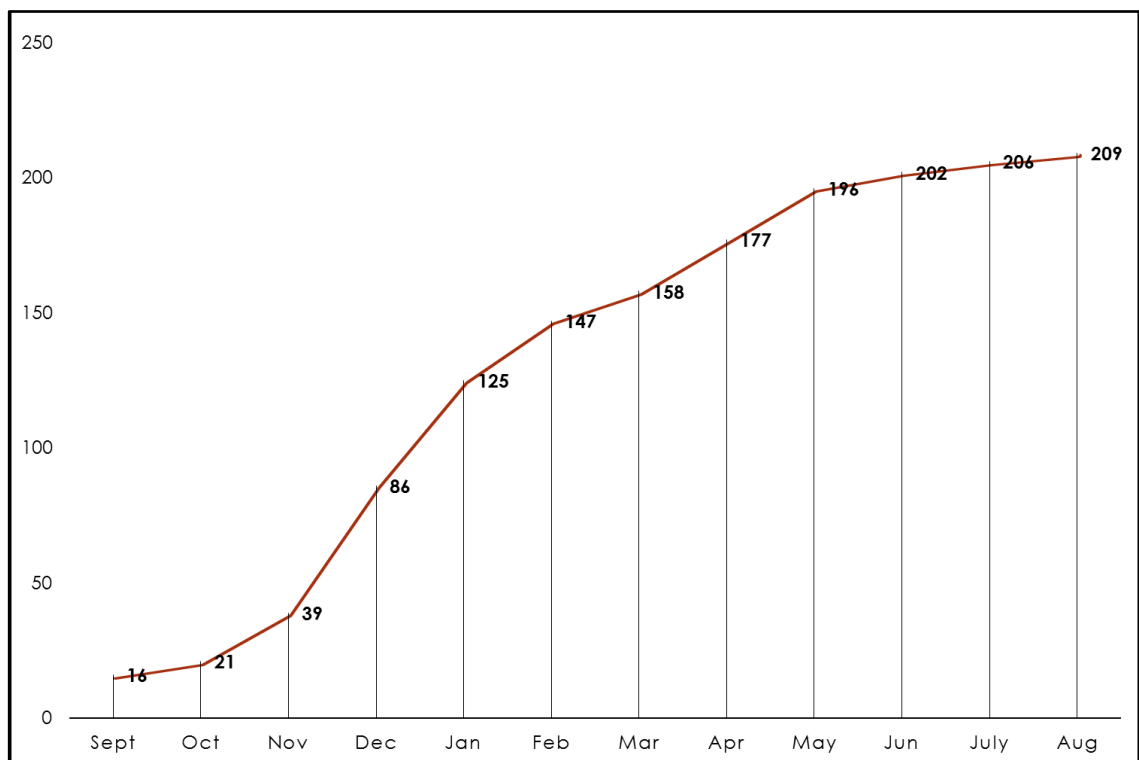
The importance of the role of management was established in the Conceptual Model, so it was necessary to ensure that a number of senior and middle managers, both academic and non-academic, were included, and three members of the executive management team and six middle managers were interviewed. Furthermore, it was necessary to ensure that both users and non-users of Yammer were included in the sample, and I decided that a 60/40 breakdown would be most useful for the purposes of this study, rather than matching the actual 30/70 breakdown of users and non-users, which may have produced an over-emphasis on barriers to use in the data collection.

2.2 Execution of Semi-structured Interviews

The LIT Ethics Committee have comprehensive guidelines and strict requirements for carrying out interviews and I obtained approval[20] from this committee in accordance with the LIT research policy before conducting my interviews. Before participating in an interview, subjects were required to sign a *Participant Information and Consent Sheet[21]*, acknowledging that participation was entirely voluntary and that they could decline to answer any question or withdraw from participation at any time and without penalty. The information and consent sheet also provides details of how data is handled and stored, and provides guarantees of anonymity and confidentiality. I prepared a *Semi-structured Interview Guide* (see Paper 3) which I used during all of the interviews. The opportunity to view this guide was presented to all participants in advance of the interviews taking place. Only nine of the 30 participants elected to view the guide in advance, which may have been due to time constraints, or indicates a level of trust with me, or perhaps both. The interview questions were based on the Conceptual Model and the outputs from the focus groups (see Paper 3). The questions were divided into three main themes, similar to the focus groups, of knowledge sharing, communities of practice and enterprise social networks. I began the interviews by obtaining some background information on the nature of the participants' role and length of service. The number of questions under each theme were minimal and designed to guide the conversation. I included a number of possible prompts for further probing in case the interviews fell flat at any stage, but this rarely happened in practice.

I conducted 30 interviews from January to July 2016 and details of these interviews are provided in Table 1. The interviews produced 22:19:24 of recorded audio. It should be noted that the majority of interviews took place in May and June 2016 when classes were finished and I believed that staff might be more disposed to giving of their time. All of the interviews took place in either the participant's office or a private meeting room, providing a comfortable and non-threatening environment in all cases, and ensuring that interruptions did not occur. I recorded the interviews digitally using two devices for redundancy, which proved to be a valid strategy as one of the devices failed to record the complete interview in four cases. I transcribed the recorded interviews using Microsoft Word, with the aid of a software application called Express Scribe Transcription Pro. This

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[20] See Appendix 1

application has a number of useful features for transcribing voice recordings such as the ability to control the speed of playback so that the user can match it to their typing speed.

Table 1. Interview Details (Yammer users are shown in bold type)

Interview	Staff Type	Date	Age Range	Service	Duration
1	**Academic**	**19/01/2016**	**45-50**	**5**	**37:49**
2	Academic	22/01/2016	45-50	18	43:02
3	Academic	05/02/2016	50-55	10	47:16
4	Academic	12/02/2016	40-45	8	55:01
5	**Academic**	**19/02/2016**	**55-60**	**17**	**35:45**
6	**Academic**	**25/03/2016**	**35-40**	**5**	**58:01**
7	Academic	01/04/2016	45-50	10	44:16
8	Academic	08/05/2016	35-40	2	35:19
9	Academic	09/05/2016	45-50	20	42:46
10	**Academic**	**10/05/2016**	**55-60**	**15**	**38:27**
11	**Academic**	**10/05/2016**	**55-60**	**16**	**31:38**
12	**Academic**	**10/05/2016**	**55-60**	**18**	**40:03**
13	**Support**	**12/05/2016**	**45-50**	**16**	**83:59**
14	Academic	16/05/2016	60-65	17	52:06
15	Middle Management	19/05/2016	60-35	17	52:26
16	**Academic**	**20/05/2016**	**45-50**	**12**	**58:28**
17	Middle Management	20/05/2016	40-45	8	51:47
18	Senior Management	20/05/2016	45-50	1	41:06
19	**Support**	**24/05/2016**	**40-45**	**15**	**35:36**
20	**Middle Management**	**24/05/2016**	**40-45**	**15**	**37:53**
21	Senior Management	24/05/2016	55-60	18	20:37
22	**Support**	**25/05/2016**	**35-40**	**12**	**51:50**
23	Support	25/05/2016	60-65	10	39:35
24	**Middle Management**	**25/05/2016**	**45-50**	**20**	**54:42**
25	**Support**	**01/06/2016**	**35-40**	**16**	**37:05**
26	Senior Management	08/06/2016	50-55	20	49:29
27	**Middle Management**	**08/06/2016**	**45-50**	**5**	**38:36**
28	Middle Management	16/06/2016	50-55	20	43:03
29	Academic	15/07/2016	45-50	10	38:49
30	**Middle Management**	**15/07/2016**	**45-50**	**18**	**42:54**
Total					22:19:24

2.3 Data Analysis

According to Miles and Huberman (1984), data analysis is based on segmenting the data into parts, and then reassembling the data into a coherent whole. To achieve this, I largely followed the methods developed by Bryman and Bell (2011) for analysing the interview transcripts. These methods require an extensive reading of all the transcripts together to

try and recognise patterns before any coding process begins. Following some manual coding of the transcripts using Microsoft Word, I used the NVivo 11 application for the more extensive, final coding process, and particularly for the combination and reduction of codes to produce categories.

I developed the codes from a combination of the inputs and outputs of the Conceptual Model and the interpretation of the interview transcripts, producing both deductive and inductive codes. I applied the codes as consistently as possible in order to maintain reliability and used sub-codes to allow the refinement of themes to a greater level of detail. Although the analysis of over 22 hours of data from thirty interviews was very time consuming, the attention to detail that was required afforded me an important opportunity for the generation of new insight and understanding.

3.0 Implementation of AR Cycle 2

The development of the interventions package for Cycle 2 of the AR project is detailed in Paper 3 of this paper series, and the list of interventions in the package is given in Table 2. The implementation of the interventions in Cycle 2 began in January 2016, coinciding with the beginning of the second semester of the academic year, and the timeline of implementations is shown in Figure 2. The planned intervention to further engage executive management was seen as crucial to increasing staff participation in the ESN and furthering the concept of CoP as a way of working across the organisation. The President of the Institute in particular had been a strong advocate of introducing CoP as a way of working in LIT and I met with her prior to the commencement of the second semester, in early January. She readily agreed to openly support the concept by promoting it in a regular newsletter published to all LIT staff through her office, and by joining Yammer and investigating how she could best use it through a facilitated training session, which was arranged for February. However, it transpired that she was subsequently offered a similar role in another HEI abroad and left LIT soon after, so neither of those agreed goals were delivered upon. The article in the President's newsletter was also to be the beginning of an awareness campaign to be delivered during Cycle 2, so this was also affected. A number of elements of this campaign were designed during Cycle 2 but not delivered, and were subsequently deferred to Cycle 3. In order to further engage management and address some of these issues, an intervention for Cycle 3 is to prepare a

briefing document for all management to be presented at a management away day (held twice a year) or at a senior management meeting.

I had become concerned about the long-term viability of Yammer because of a lack of development by Microsoft since it acquired the company in June 2012, and whatever chance the ESN had of survival in LIT would almost certainly be severely hampered if a new and different technical solution had to be introduced. The doubts relating to Yammer's future were also widely raised on online discussion fora relating to Yammer and other Microsoft applications. I discussed this situation with senior Microsoft staff in both January and March and was reassured that Yammer was very much on their development path as part of the Office 365 programme and would continue to be developed, with enhancements being introduced once the integration with Office 365 was complete. This was further reinforced by comments on the online fora around this time.

Table 2. Interventions for AR Cycle 2 (Jan – Apr 2016)

No.	Intervention
1	Further engagement of management, with a view to increasing participation, especially at executive level.
2	Investigate Microsoft development path for Yammer.
3	Follow up with potential community leaders identified from Cycle 1.
4	Awareness and information sessions for all staff groups at all campuses.
5	Provide additional functionality on ESN external to vCoP, such as support groups, working groups, department groups, and information feeds.
6	Identify ESN champions that are not community leaders.
7	Provide training for CoP and community leaders that were not included in Cycle 1.
8	Provide training and support at individual and group level, with training materials accessible on Yammer.
9	Conduct an awareness campaign to include emails, advertisements on information portals and digital signage; Webinars and live training sessions.

During Cycle 1, I received 15 expressions of interest for establishing vCoP, and from these, ten potential community leaders were identified, leading to the establishment of seven vCoP with corresponding Yammer groups. I followed up with the other three potential community leaders and they all agreed to become involved in the establishment of new communities. In addition, three other communities were established bringing the total number of vCoP to 13 by the end of Cycle 2. To comply with conditions of confidentiality and anonymity, the names of the communities will not be reported in this paper. The sizes of the communities range from four members to 61 members, with an

average of 13 members. A number of ESN champions emerged over the course of Cycle 2, with champions identified as frequent and high-worth contributors to groups - individuals who appear to be comfortable using the medium to share knowledge and engage in discussions with colleagues. By observing activity on Yammer, I identified five individuals who are not already community leaders, and all were very willing to be recognised as champions within their respective communities. I engaged with them to explain the concept of champions and why it is important for the development of the ESN to have a number of these. I also provided them with some guidance on the role of champions so that their subsequent postings and activity were conducted with that understanding of their role.

Figure 2. Timeline of Interventions and Data Collection for AR Cycle 2 (Jan – Apr 2016)
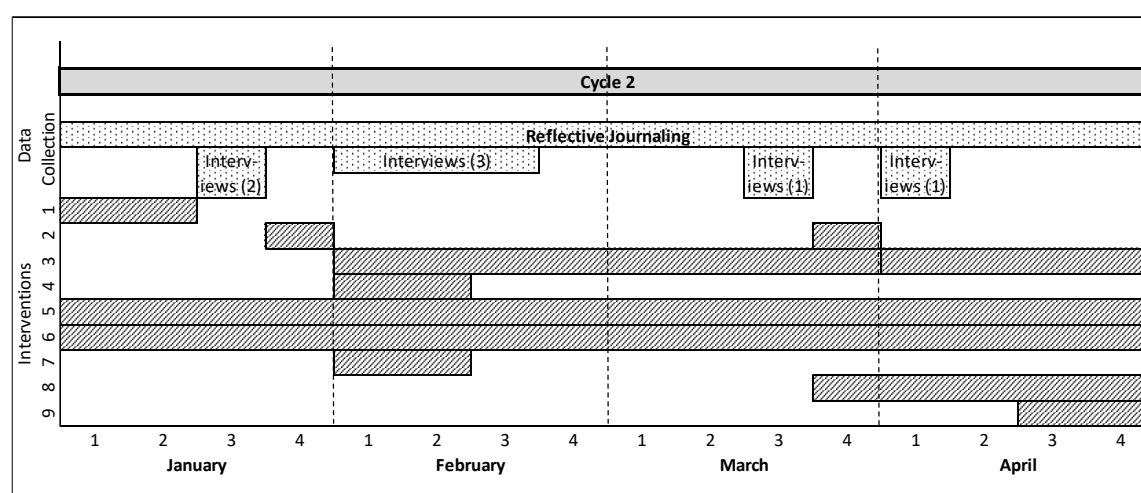
Awareness and information sessions were held on the main campus and one other campus over a two week period in February when there were no classes. Although, these sessions were available to all staff from all campuses to attend, sessions were not provided on two of the other campuses due to time constraints, and were deferred to Cycle 3. Training for communities and community leaders were also provided in group sessions in conjunction with the staff awareness sessions. Additional training material for both Yammer and community participation and management was provided online, and is available on Yammer. A Yammer support group called Yammer 101 was also established as a community on Yammer and has attracted a number of users who wish to explore using Yammer beyond its basic features.

A number of groups have been established on Yammer that might not be considered as communities of practice, such as department groups and academic course groups (see

Figure 3 for an example), with a number of others established for particular purposes, such as organising events and conferences, which could be considered as project groups. The establishment of this type of group is considered important to the long-term viability of the ESN as they engage staff who might not otherwise have had a reason to use the platform. The engagement of the middle management layer in the organisation is pivotal to the establishment of this type of group.

As each of the interventions was completed, I reflected upon each of them using Gibbs' (1988) reflective cycle, with particular focus on establishing the positive and negative outcomes, presented in Table 3, and using these to inform the development of the interventions' package for Cycle 3. I also used the data collected during this cycle, consisting of reflective journal entries and seven semi-structured interviews, to inform the development of interventions for Cycle 3.

Figure 3. Example of Course Board Yammer Group

4.0 Implementation of AR Cycle 3

The summary of interventions for Cycle 3 is given in Table 4 and implementation of Cycle 3 began in May 2016, coinciding with the end of the second semester of the

academic year, and the timeline of implementations is shown in Figure 4. I prepared a briefing document for the management team at LIT but it was agreed with members of the Executive, including the interim President, that it would be better to wait until the new academic year, in September, when the new President is in office, before presenting this document to management. Although I would have preferred to make a presentation during the course of Cycle 3, any increase in usage patterns and management engagement that would have developed as a result, would only present during the new academic year in any case, and the intervening summer recess might have been detrimental to any such gains. However, I did manage to increase management awareness during the course of the interview cycle, with ten members of the management team interviewed, including three members of the Executive.

Figure 4. Timeline of Interventions and Data Collection for AR Cycle 3 (May – Aug 2016)
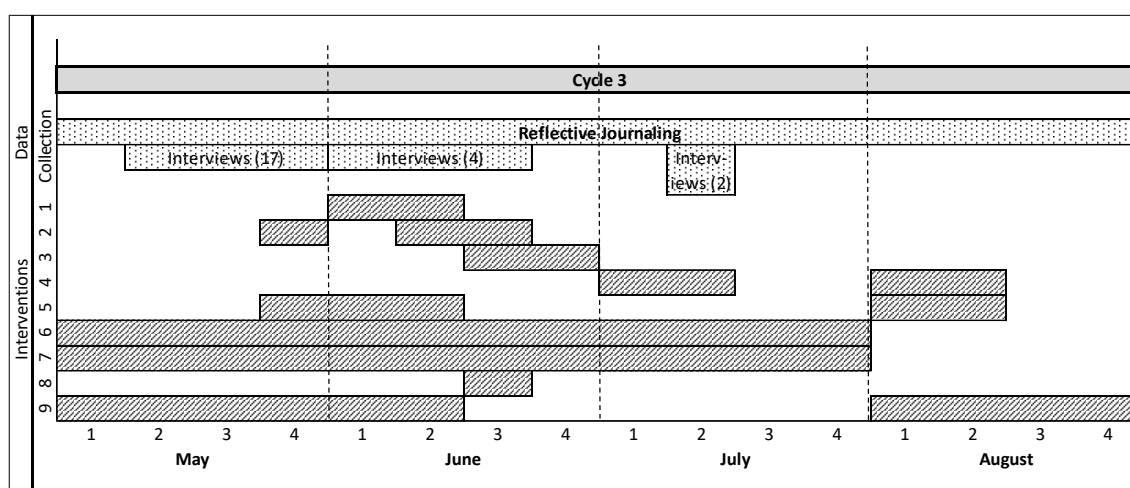
These meetings also afforded me the opportunity to advocate for the inclusion of support staff in Staff Development days in the future, and it was generally agreed that this would be a favourable development. I developed a generic terms of reference for CoP and a framework to help establish communities, and both of these are now available for access on the LIT Staff Portal and Yammer. However, these documents have yet to be approved by the Executive as official LIT documents, but this should be achieved in conjunction with a presentation to the management team. I developed a fully structured training session for staff on how CoP operate and how to use Yammer, in conjunction with the Computer Services Department, and the availability of this training has been advertised to middle management for delivery at a department level.

Table 3. Cycle 2 Interventions and Outcomes

No.	Intervention	Positive Outcome	Negative Outcome
1	Further engagement of management, with a view to increasing participation, especially at executive level.	Initial support from the LIT President with planned actions.	Actions not implemented as President left the organization during Cycle 2.
2	Investigate Microsoft development path for Yammer.	Reassurances received from Microsoft that Yammer development path is part of their long term strategy	Microsoft are slow to deliver in planned changes that would enhance the Yammer user experience.
3	Follow up with potential community leaders identified from Cycle 1.	Three additional communities were established as a result of this.	Some staff are leading more than one community, which is not ideal in terms of sustainability.
4	Awareness and information sessions for all staff groups at all campuses.	Implemented successfully on two campuses during Staff Development days.	Limited to academic staff due to the design of Staff Development days, and two other major campuses were not included due to time constraints.
5	Provide additional functionality on ESN external to vCoP, such as support groups, working groups, department groups, and information feeds.	A number of department groups and special purpose, project groups were established.	Attempts to engage with a number of service departments did not deliver additional functionality on Yammer.
6	Identify ESN champions that are not community leaders.	Five champions identified, engaged with and coached on the role of champions.	More champions are needed, with a requirement of at least one per community, and more for larger groups.
7	Provide training for CoP and community leaders that were not included in Cycle 1.	Provided in conjunction with awareness sessions held during Staff Development days.	Limited to academic staff due to the design of Staff Development days, and two other major campuses were not included due to time constraints.
8	Provide training and support at individual and group level, with training materials accessible on Yammer.	Training materials for both Yammer and community participation and management was provided online, and are available on Yammer.	Membership of a Yammer instructional community has had a low uptake, with only five staff joining.
9	Conduct an awareness campaign to include emails, advertisements on information portals and digital signage; Webinars and live training sessions.	Some materials have been sourced and prepared.	Impacted by the departure of the President who was to lead the campaign.

Table 4. Interventions for AR Cycle 3 (May – Aug 2016)

No.	Intervention
1	Prepare briefing document for management and request to present at management away day or senior management meeting.
2	Advocate for the inclusion of support staff in Staff Development days.
3	Develop generic terms of reference for CoP and make available on ESN.
4	Develop blueprint for establishing CoP and make available on ESN.
5	Develop structured training sessions on ESN and vCoP and make available to departments.
6	Continue to provide additional functionality on ESN external to vCoP, such as support groups, working groups, department groups, and information feeds.
7	Identify potential champions that may not yet be Yammer users, but who may act as ESN ambassadors.
8	Engage HR to investigate using Yammer and vCoP as a mentoring environment for new staff.
9	Continue with awareness campaign to include emails, advertisements on information portals and digital signage; Webinars and live training sessions.

Given the time of year that this was completed, no training sessions took place, but it is expected that department training sessions will commence in September when academic staff return to work. A number of additional department groups and special purpose, project groups were established and I engaged with some of the service departments with a view to using Yammer as an information feed for staff from September (see Figure 5 for examples of different groups). Both the Computer Services Department and the Sports Office have expressed interest in doing so, and this should lead to more users on Yammer. I identified four staff members as potential community and ESN champions and requested interviews with them, which they readily agreed to. Although they all expressed high levels of interest in participating in vCoP on Yammer, none of them have engaged so far, all citing time constraints as the main inhibitor to becoming involved. I arranged a meeting with HR personnel and discussed the possibility of them using Yammer as a means of providing on boarding and mentoring services to new staff, using case studies to demonstrate organisations that have successfully used this approach. Although the HR team are interested in pursuing this option, it will require some process changes and training before anything can be achieved.

I have designed an awareness campaign with the Computer Services Department and this includes emails, advertisements for the information portals and digital signage, and webinars to take place on Yammer, called YamJams. I decided to defer the rollout of this

campaign to September in order to coincide with the advent of the new academic year and mitigate against any loss of momentum that the summer recess would inevitably bring about. As each of the interventions was completed, I reflected upon each of them with particular focus on establishing the positive and negative outcomes, presented in Table 5, and using these to develop a series of interventions (see Table 6) to continue to grow the ESN user base and encourage the establishment of more communities, which is necessary to ensure the continuation of the practical element of the project. Yammer activity for the period of the AR project in terms of posts, reads and likes, is shown in Figure 6, with noticeable dips in activity during academic recess periods. As this is the final cycle of the AR project, I used the final phase of the cycle, *Specifying Learning*, to inform the findings of the research and feed into the discussion, which will be presented in Section 3 of the DBA thesis.

Figure 5. Examples of Yammer Groups
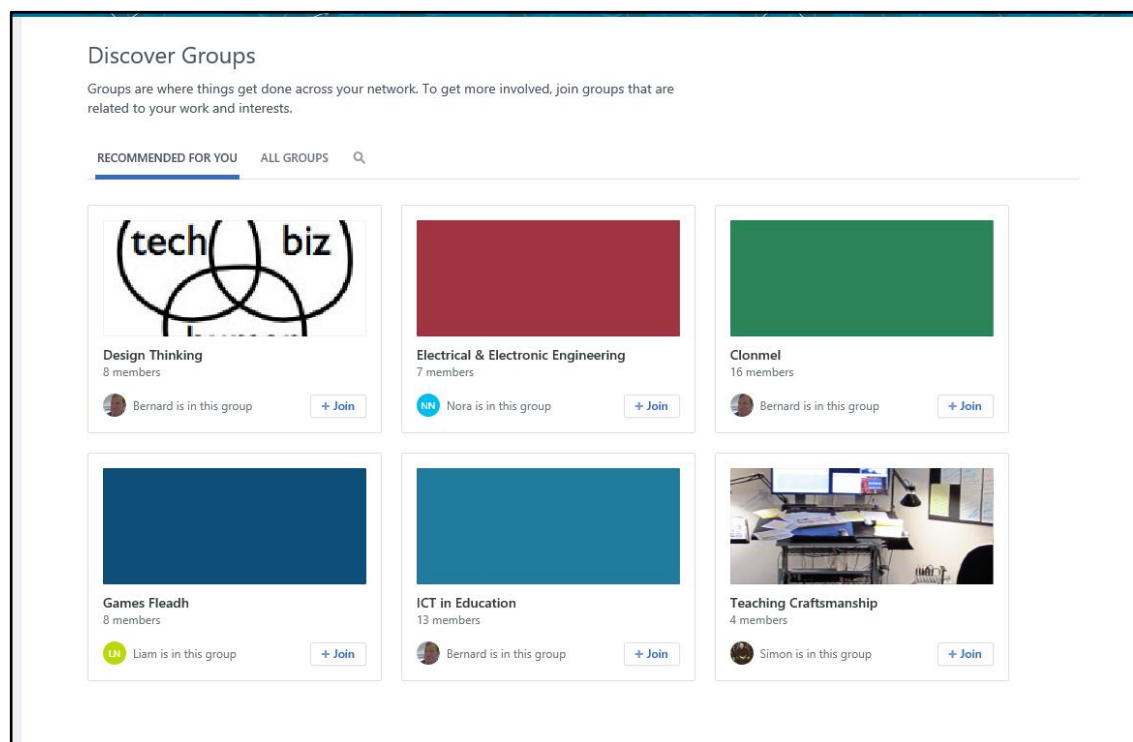
Table 5. Cycle 3 Interventions and Outcomes

No.	Intervention	Positive Outcome	Negative Outcome
1	Prepare briefing document for management and request to present at management away day or senior management meeting.	Document prepared.	Presentation deferred until post September 2016 once new LIT President has taken office.
2	Advocate for the inclusion of support staff in Staff Development days.	Done through interviews with members of management team.	Needs to be included in presentation to management team.
3	Develop generic terms of reference for CoP and make available on ESN.	Document developed and made available to staff.	Documents have yet to be approved by the Executive as official LIT documents.
4	Develop blueprint for establishing CoP and make available on ESN.	Document developed and made available to staff.	Documents have yet to be approved by the Executive as official LIT documents.
5	Develop structured training sessions on ESN and vCoP and make available to departments.	Training material developed and availability advertised to departments.	No training sessions delivered during Cycle 3.
6	Continue to provide additional functionality on ESN external to vCoP, such as support groups, working groups, department groups, and information feeds.	Additional department and project groups established on Yammer.	Some service departments have not engaged with the ESN or shown any interest in doing so.
7	Identify potential champions that may not yet be Yammer users, but why may act as ESN ambassadors.	Four potential champions identified and interviewed.	These staff have not yet engaged citing time constraints as the main inhibitor, so no new ESN ambassadors have been established through this intervention.
8	Engage HR to investigate using Yammer and vCoP as a mentoring environment for new staff.	HR have indicated that they are positively disposed towards this.	HR have not fully engaged yet and are unlikely to do so in the short-term.
9	Conduct an awareness campaign to include emails, advertisements on information portals and digital signage; Webinars and live training sessions.	Awareness campaign designed.	Not delivered during Cycle 3 due to time of academic year.

Figure 6 Yammer Activity (Sept 2015 – June 2016)
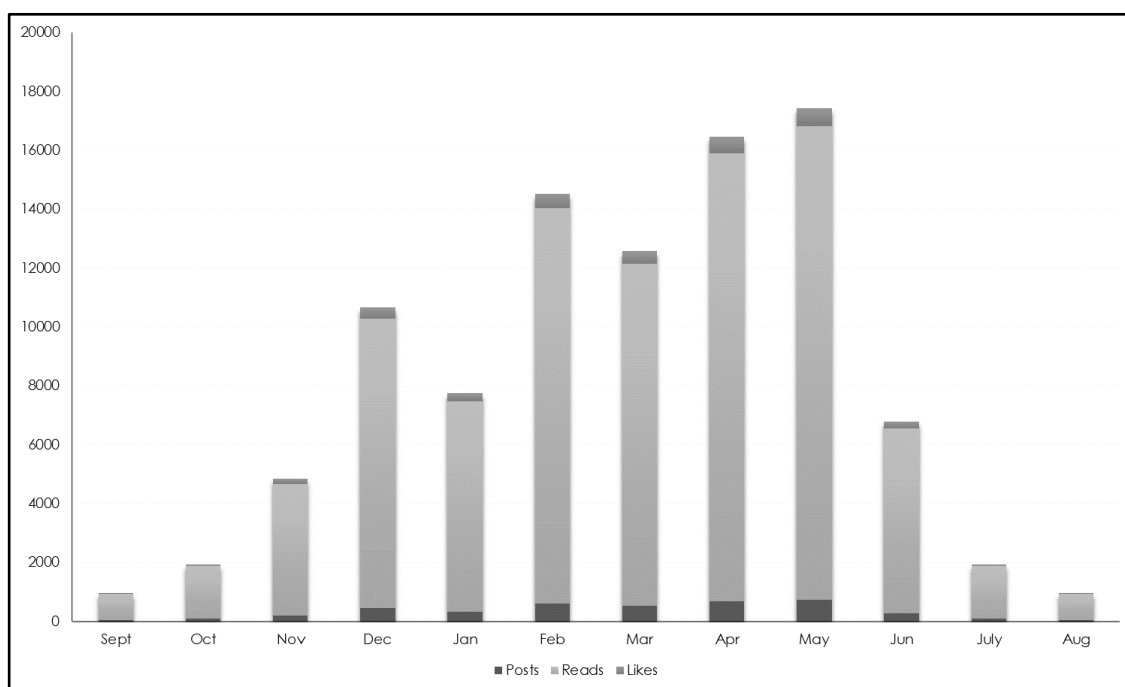
Table 6. Planned Interventions post AR project completion

No.	Intervention
1	Develop new terminology to replace ESN and 'social media'.
2	Expand communities' model to include communities of interest, communities of place (e.g. a campus community), and external communities.
3	Develop case studies of successful CoP to promote CoP model.
4	Establish metrics to determine the health and success of communities.
5	Develop a best practice guide for ESN users to help establish it as part of daily work routines.
6	Devise strategies to increase participation rates in CoP by moving members along the membership life cycle as per Lave and Wenger (1991).
7	Develop a role/job description for an Enterprise Community Manager.
8	Work with HR to develop the ESN for social on boarding and mentoring of new staff.
9	Investigate the use of Yammer as a teaching and learning tool for students in order to engage more academic staff.
10	Identify staff who see knowledge as a public good, with a view to becoming ESN ambassadors.

5.0 Key Findings

In the analysis of the overall data set, I used the conceptual model and associated research questions as a focus, and the main findings are presented in the context of these. The basis for the research, the existence of a divide between academic and other staff and a resultant

lack of interaction and communication, is well supported by the data. For example, interviewee [13] describes a "massive disconnect between academic staff and support staff" and claims that neither side can "see the benefits that each could bring to the table". This is supported by [17] who states that "neither side understands the challenges of the other side", by [22], who feels that there is a "disconnect between the academic side of things and the service side", and [21], who claims that the "crossover of information between the academic side and the service side is well documented as being less than perfect in higher education". It should be noted that the existence of this divide is mostly perceived by support staff (75%), with only 10% of faculty describing it as an issue. However, 75% of interviewees described the organisation as being divided into silos with little communication or interaction between them. Interviewee [15] describes "a silo mentality" as being a "very real problem" for the organisation and claims that for a knowledge sharing culture to develop, "operational and managerial silos have to be broken down". The existence of silos is perhaps best described by [19]:

> People are also in their own silos. My experience of that silo culture is that people very much look after their own, and look to their own group. They don't want to interact, or don't interact with other groups, because they see their job as being from A to B and that your job has nothing to with mine.

Interviewee [14] is "amazed at how siloed the existence of people is within departments themselves", and this is also reflected by the responses of 89% of academic staff, who describe the isolating nature of the lecturing role. For example, [10] describes the academic existence within the organisation as being "on your own" with "very little knowledge sharing", and describes the whole structure as being "about a single individual going on your own path". This can be a particular problem for newer academic staff, with [8] claiming:

> I'm new to this role so I'm still learning very much about how things work within the department and the Institute and I've found it a very isolating experience. I suppose I'm finding that very difficult, or very different - you're on your own and nobody really knows what you are doing within your modules.

Although the perception of the divide between academic staff and support staff is more strongly held by the latter group, the isolating nature of the academic role and the fragmentation of the organisation into silos, all contribute towards an organisational

culture which limits the opportunities for staff interaction, collaboration and knowledge sharing.

5.1 Antecedents for Knowledge Sharing

Table 7. Antecedents Emerging from the Study

No.		Antecedent
1		Management support is pivotal to the success of knowledge sharing initiatives.
	1a	Leadership
	1b	Understanding
	1c	Encouragement and support
	1d	Role of middle management
2		There must be a clear terms of reference for CoP which is agreed by its members.
3		There needs to be a generic blueprint for the formation of CoP.
4		Structured training programmes need to be developed and delivered.

The importance of all of the antecedents in the Conceptual Model is supported by the data, with Management Support emerging as the most critical antecedent. 100% of the non-management interviewees viewed management support as being critical to the success of both the communities' model and the use of Yammer as an organisational communications and collaboration tool. However, the importance of this was not reflected by the management interviewees. Interviewee [10] cites a lack of understanding from executive management about what interdisciplinary collaboration is actually about: "The college can write in its strategy that we are going to do inter-disciplinary projects and we are going to do this and we're going to do that - it's my own personal belief that our executive managers don't understand how to do that". The role of middle management, consisting of heads of academic departments and service department managers, is seen by many as vital to enable such a cultural shift in the organisation. Interviewee [14] feels that "it's at heads of department level that things either fall down or are shaped in a positive way, that they become the key link in knowledge sharing", and [10] indicates that the uptake of ESN tools by staff will only happen if use is encouraged by their own managers rather than being imposed by an "outside service department". A number of interviewees described leadership as being a pivotal aspect of management support, with [13] opining that a knowledge sharing space "needs to be encouraged from the top down" and "managers must say it's actually ok for you to do this, because I think

that people will be very slow to do things like that without getting permission". Interviewee [29] believes that it would be a very positive development if "management could communicate and encourage that message... because there is an awful lot of goodwill there".

Attempts by management to gain control of communities that are viewed as successful was described as a potential problem, and any such efforts should be resisted. According to [9], "...how supportive is LIT of knowledge sharing? The whole point of communities of practice, I assume, is that there is no ownership. Lesson number one for me was, as this began to grow, management wanted to take ownership", and [10] stated that "management see these as working and then they try to change them into something else. They make it a more formalized thing. Once a community gains quite a bit of traction, somebody will pull it out and use it to go after research money or something else". This indicates that all CoP should have a clear terms of reference that defines what the community is for and what the expected outcomes and deliverables are, and that this is fully understood and acknowledged by all stakeholders, including management. In addition, structured training must be available for communities during a facilitated start-up phase [2, 9, 27], and this phase should include face-to-face kick-off meetings [2, 12, 16], with [12] insisting that "we should get everyone in a room together to explain what it's about to everybody". Interviewee [10] strongly advocated structured training sessions delivered at a department level, rather than at group or community level, reasoning that staff will attend if they are requested to do so by their managers. This highlights the need for the development of a blueprint for the creation of CoP, detailing the steps involved for community leaders and members, including things like how to organise kick-off meetings.

5.2 Dominant Problems

All of the organisational and individual problems in the Conceptual Model present to various degrees in the data. In general, the structure of the organisation is recognised as being a major impediment to the development of a knowledge sharing environment, with a number of interviewees discussing the evolution of the organisation, and its transition from the VEC and RTC[22] models, to an IoT, and in the context of wider public sector

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[22] Vocational Educational Committees (VEC) and Regional Technical Colleges (RTC) were precursors to the IoTs

structures [15, 21, 24]. This was contrasted with the structure of universities which don't display the same rigid bureaucracy and perhaps have more academic freedom, which may be conducive to knowledge sharing [11, 12, 16].

Table 8. Dominant Problems Emerging from the Study

No.	Dominant Problems
1	The structure of the organisation is a major impediment.
2	Lack of a research focus limits the need for collaboration.
3	Size and geographical dispersion of the organisation.
4	Not enough time to participate in knowledge sharing activities (all staff).
5	Fear that regular use may be misinterpreted by management.
6	Attitudes towards social media and connotations from the terminology (e.g. ESN)
7	LIT staff has a high age profile and many staff do not use social media of any kind.

The size and geographical dispersion of the organisation was also highlighted as problematic in this regard with a number of former Tipperary Institute[23] staff contrasting their experience of now working in the larger organisation with that of a much smaller, tighter organisation which had an open and sharing culture [11. 13, 14, 20]. A further organisational barrier that emerged from the data was the lesser emphasis on research in the IoT sector compared to the university sector. Some contrasting viewpoints were presented with [16] arguing that "if there was more of a focus on doing research here it would be a help, because when you're doing research, you realise that what you know is limited, and even research by nature - you're supposed to be thinking outside the box and looking at things in different ways", and [13] suggesting that "if we don't start opening up conversations and equipping people with the knowledge and the tools and the skills to have those conversations, and to be equipped in how to carry out research and do research", then research simply won't develop.

This argument can be linked to the strongest individual barrier that presented in the data - time, the most cited reason for lack of participation in knowledge sharing activities. This applies to all staff, where academic staff face an 18 hour contact workload and support staff feel that they are under resourced to adequately provide the required levels of service. Interviewee [5], an academic, felt that "it would be nice to have that kind of way

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[23] Tipperary Institute (TI) was amalgamated with LIT in 2011

to come together and meet [CoP], if we weren't so busy with teaching", and an academic manager [20], reported on issues within a particular department: "the one common feedback from everybody, is that there is no time for personal development, sharing and engagement. People are under pressure once term starts - 18 hours - It's impossible to find time within that". A member of support staff [13] strongly asserted that "time is a massive factor, even for allowing yourself that space to personally reflect. Once the end of August comes, it's firefighting until February, and then months like May and June are incredibly busy. So time is a problem for people".

Fear factors are also prevalent, highlighted by a number of interviewees discussing fear and trust issues as inhibitors to participation [1, 7, 9, 30], There are a number of aspects to being afraid of participating that surface prominently in the data. Both [11] and [13] described a lack of understanding of the nature of social media tools by their managers as an inhibitor to their use, with [11] mentioning that "I've heard some comments about knowledge sharing tools being used as spying tools. It's like, in order to be working you need to be online". Interviewee [13] further described a fear that management would not understand why a member of staff would want to participate in a CoP that was not part of their cognitive domain:

> It could become a monitoring tool. If I engage too much, I think that it could become a difficulty, with my efforts going into something that is not necessarily my job. And that could be something that maybe other people might fear too. It wouldn't be seen as being part of your job. I'm engaging in this when there are other things that might need to be addressed.

The attitudes of staff towards social media and the terminology used to describe social media tools, such as ESN, also presented as individual barriers to use. Many staff see social media as something that should only be used outside of work and could not see any application for it in the workplace. The terms used to describe it, such as 'social media' and 'enterprise social networks' also appear to be problematic, either suggesting applications for frivolously chatting with friends in the first instance, or meaning nothing very much at all in the second. According to [23]:

> I think that if it is a social media tool, it's maybe associated with entertainment or something like that and that it's not seen in a professional way. I think that there might be a misconception around that because they are aligned to entertainment tools rather than something that's professional, and not taken seriously.

A number of interviewees struggled with the terminology, with [10] stating that "I'm not ofay with all the acronyms in IT, but I would just pick up on the social media aspect of the terminology and I would have immediately thought of Twitter and Facebook and I would probably start to run out of interest", and [28] admitting that "the words don't mean anything to me at all".

5.3 Key Motivators for Knowledge Sharing

Table 9. Key Motivators Emerging from the Study

No.	Key Motivators
1	Individual personality where knowledge is seen as a public good.
2	Professional pride in helping people through sharing knowledge.
3	Enjoyment, interest and stimulation
4	Making work easier by reducing workload.
5	Possibility of non-financial rewards.
6	CoP can provide a space for people to have a professional identity.

All of the key motivators identified in the Conceptual Model are supported by the data. A number of interviewees felt that staff of a certain personality type are more inclined to openly share knowledge with, or to seek knowledge from others, and that the activities of these people have a positive effect on the development of CoP [9, 16, 22, 24]. This supports the idea of those that see knowledge as a public good, being motivated to share. Interviewee [11] felt that as "professional people, there is a certain amount of pride in what you do, and there is also pride in helping people". [22] described deriving a "benefit from posting something or answering a question, because that makes you feel good about yourself. It can only help you, the fact that you provided someone with information - there's a feel good factor to that. You're being useful". Interviewee [24] stated that:

> Lots of people have tonnes of experience but they carry it around themselves and they don't even think that others could benefit from it. It's a personality type that recognises that I have something that you might need, or you have something that I might need. So it's only through one or two people, like the rotten apples only in reverse, that communities can grow.

Therefore, identifying people in the organisation who have these personality traits but may have not yet joined the ESN, but who might be willing to participate and act as ESN ambassadors, is an important future intervention to stimulate the growth of CoP.

Staff are motivated to use ESN and participate in vCoP if they either find their engagement to be enjoyable, interesting or stimulating, or if they can derive other benefits from participation, such as making their working lives easier or deriving some rewards in terms of recognition or career progression. It seems to be generally accepted that it is not possible to receive direct benefits, such as financial reward, from participation, although one academic manager [20] proposed that "there has to be something for a department as a collective to help them [staff]. Money talks all the time to get people to do stuff. But if we can't give them money, we have to give them something indirectly". However, staff generally won't participate unless they are interested in the subject matter of a CoP, with [30] asserting that participation "would depend on what would interest people, because if you don't have something that will interest people, you've lost them straight away". Certainly, the possibility of reducing workload is a strong motivational factor and many interviewees spoke about the opportunities that CoP presented for not having to reinvent the wheel, as described by [13]: "you can waste so much time, but by having a simple conversation with somebody or a group of people, you can take hours and hours of reinventing the wheel out of it".

5.4 Perceived Benefits

Table 10. Perceived Benefits Emerging from the Study

No.	Perceived Benefits
1	Potential to positively change the organisational culture.
2	ESN and vCoP can be used to provide support for new staff.
3	Career progression.
4	Increased sense of identification with, and loyalty to, the organisation.
5	A positive knowledge sharing culture may help reduce stress levels.
6	Monitoring CoP activity could provide indications of areas to resource.

All of the interviewees were of the opinion that both the use of ESN and a CoP model would be of significant benefit, both to themselves in their jobs and personal development, and to the organisation. Much of the commentary was aspirational in nature and spoke about a desire for change in the organisational culture that might arise from the establishment of an active and vibrant knowledge sharing environment. However, a number of more tangible organisational benefits were also elucidated. Interviewee [10]

spoke about the possibility for "communities of practice to break down the social divides" and "eliminate the siloes" in the organisation. Interviewee [14] discussed the nature of how the use and creation of knowledge has developed as being disparate with the manner in which "we still organise our organisation into departments and disciplines", and reasoned that CoP have the potential to create new knowledge by acting as places where "you get that cross-fertilization much better than you do in formal structures". Many interviewees had practical examples of CoP that they might like to form which would provide considerable organisational and individual benefits. For example, it appears that new staff find it particularly difficult to engage with the organisation and limited training opportunities are provided. Interviewee [8], who was relatively new to LIT, described their situation as "new to this role so I'm still learning very much about how things work within the department and the Institute and I've found it a very isolating role, even though I have met people who are willing to get involved and share information, but there's nothing structured there so far that I have come across", and "can't understand how there isn't a mentoring system where you could meet someone on a regular basis while you are new". Interviewee [10] described a "huge cultural change in transitioning from another working environment", and both [8] and [10] felt that an ESN and vCoP might have a role to play in providing supports for new staff members.

Career progression was highlighted by a number of interviewees as a potential benefit of CoP participation, although the examples given were taken from the university sectors in the UK and Ireland. For example, [27] worked in a university where a colleague's participation in a CoP "helped him on his career path because this community that he was involved in suited him better than the department that he was in and he was able to change disciplines". Another [9] was of the opinion that, in the university sector, "career development depends on this new knowledge that they have developed", and CoP participation can help to generate that new knowledge.

A perceived benefit that was particularly prevalent from support staff, was the opportunity for CoP participation and general increased knowledge sharing activity to help make them feel more a part of the organisation. Many support staff feel a sense of detachment from the organisation and this is highlighted by the commentary on the divide between academic and support staff. A member of support staff [15] felt that actively participating in CoP and engaging more with academics "would give me a much better sense of

engagement with the organisation", and another [25] said that participation would help them "to identify with the organisation".

6.0 Reflecting on the Data Collection and Analysis

Myers and Newman (2007) find it somewhat surprising that the qualitative interview is treated as unproblematic in many studies. Although seen as an excellent means of gathering data, it presents many difficulties, and these problems are often ignored in the presentation of the research, perhaps in part, due to a lack of appreciation on behalf of the researcher of the strengths and weaknesses of the technique. I was able to overcome the majority of the problems identified by Myers and Newman (2007) by virtue of my longevity in the organisation and my previous role, in which I had to deal with practically every member of staff at some stage. This mitigated against problems such as a lack of trust and the potential for artificial interviews brought about by the interviewer being a stranger. It also gave me access to all levels of the organisation. As a former member of the management team, all of the senior and middle managers are well known to me and readily agreed to be interviewed. My knowledge of the organisation also allowed me to negotiate the potential political pitfalls of the interviews and steer clear of controversial topics that might cause offence or sensitivity. The potential for elite bias was overcome by selecting a diverse sample population and interviews were carefully scheduled to ensure that interviewees had time to participate without being under pressure. I developed a thorough understanding of potential problems in conducting the interviews themselves, such as interfering with subject's opinions, known as the Hawthorne effect (Fontana and Frey, 2000), constructing knowledge by being overly dominant during interviews, and using ambiguous language in questioning. This recognition of the potential pitfalls allowed me to mitigate against their occurrence, or at least to minimise their influence on the research (Birchall, 2014).

I found that the guarantee of confidentiality enabled interview subjects to be completely honest about potentially sensitive and controversial matters, and that helped to enrich the discussions, particularly with regard to organisational dynamics. I also followed the advice of both Smith (2008) and Sin (2005) and adopted a pragmatic approach to the principle of informed consent, discussing these ideas with all of the research participants. I considered the power relations in both directions, especially when conducting interviews, as per Bell and Bryman (2007), both to protect the rights of the participants

and to ensure that my rights as a researcher were represented, leading to a flexible interpretation of the principle of informed consent.

According to Eisenhardt (1989), data collection can sometimes overlap with data analysis and, if approached proactively, data collection can provide a useful platform for subsequent analysis. Following this assumption, I found it helpful conducting the interview phase having already identified key themes from the focus group phase, leading to the second phase of data collection being informed by the analysis of the first stage, and this maximised the opportunities for identifying emerging findings.

I afforded the participants the opportunity to review the transcripts of their interviews in case they wished to make any changes. Only four participants requested to see the transcripts and, of these, only two requested minor changes which did not have any bearing on the outcomes. According to Myers and Newman (2007), this process is an important part of the research process as it presents the opportunity for clarification and avoids any ambiguity in the reported findings that might stem from a misinterpretation of the interviewee's answers. Liamputtong and Ezzy (2005) also emphasise that it serves to increase the validity and rigour of the study. I also used the reflective writing technique after each interview to analyse how I had conducted myself during the interview in order to learn from any mistakes that I made and to see if I could improve my interviewing technique for subsequent interviews. This process also enabled me to track how themes were developing and to explore potential links to other ideas. Although some of the questions in subsequent interviews varied somewhat as a result, I felt it was important to strike a suitable balance between varying the questions to explore themes and maintaining the cohesion and integrity of the question framework. However, the nature of semi-structured interviewing affords subjects the opportunity to offer information they think might be relevant, and a number of subjects independently offered material that contributed significantly to the topic.

My role as interviewer was explicit and clearly understood by all participants with each interviewee receiving the same explanation in the request for interview and again at the outset of the interview, to establish a similar context. Although my personal relationship with the majority of the interview subjects ensured a good rapport during the interviews, I felt that it was important to maintain a level of formality so that the interview structure could be applied consistently throughout the interview. The semi-structured approach of

the questioning helped in achieving a level of consistency, but the approach also needed to ensure a standard questioning style. There was a danger that, as each interview progressed, the interviewing style could potentially become more informal, so I took care not to lose direction, which helped to maintain validity as well as comparability between each interview.

In shaping the overall approach to data analysis, relevance to the research questions is of fundamental importance. The validity of the analysis was strengthened by an iterative reference to the research questions throughout, which I found to very helpful in maintaining focus while probing into the data. I focused on analysing the data to answer the specific research questions and tried not to get side-tracked by answering diverging questions, many of which arose during the analysis. I felt that validity of the study was maintained through a constant reference back to the research questions and research framework. One of the advantages of using NVivo is its ability to produce an audit trail, which can add methodological rigour and transparency to a study. A clear series of events that led to the emergent findings can be shown. These steps should be retractable to the original raw data to enlighten potential auditors on how the final conclusions were reached and adds integrity to the analysis. However, notwithstanding the benefits of using an application such as NVivo for dealing with large data sets, such as some 150,000 words of focus group and interview data in this case, there are some drawbacks to using such applications. I feel that using NVivo might encourage the user to code every part of the interview transcripts without taking time to think and reflect upon data, which could lead to an overly descriptive and ordinary analysis. Because it is easy to do, there might also be a temptation to extend the coding beyond any real benefit for understanding the data. Furthermore, because coding is based on a given set of categories, one of its weaknesses is that it can establish "a powerful conceptual grid" from which it can be difficult to escape, potentially reducing opportunities to discover emergent themes (Silverman, 2000, p.825).

7.0 Summary

The data analysis supports all of the inputs and outputs of the conceptual model and indicates that the model can be used to conceptualize the creation of a knowledge sharing environment in a HEI. A number of additional findings in relation to the research questions have also emerged from the data and these can be used to develop the model to

increase its usefulness for practical implementations and to further the theoretical understanding of the development of knowledge sharing environments in HEIs. These findings will be discussed in the context of the research questions in Section 3 of the DBA thesis. A number of limitations were also encountered, notably the time scale for the AR project, which was found to be relatively short in relation to the structure of the academic life cycle. This, and other limitations will be explored in Section 3 of the DBA thesis.

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Appendix 1: Approval Letter from LIT Ethics Committee

LIT

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President LIT / Úachtaráin ITL

Niall Corcoran
Dept. of IT
Limerick Institute of Technology
Moylish Park
Limerick

13 June 2016

Re: Application for Research Ethical Approval

Dear Niall,

I wish to inform you that your resubmitted application for research ethical approval was reviewed at a recent meeting of LIT's Research Ethics Committee.

The Research Ethics Committee made the following decision in relation to your application:
Application approved without modification/amendment

Yours sincerely

Patrick Murray

_____
Dr. Patrick Murray
Head of Research and Technology Transfer

Cláir Chistí Struchtúracha AE
na hÉireann 2007-2013
Cómhaoinithe ag Rialtas na hÉireann
agus ag an Aontas Eorpach

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A Study to Investigate How Enterprise Social Networks Can Enable Staff Knowledge Sharing in Virtual Communities of Practice in Higher Education.

Semi-structured Interview Guide

Interview Data

Date:			
Time:	**Start:**		**Finish:**
Location:			
Interviewee:			

1. Go through Participant Information & Consent Sheet
2. Discuss purpose of the research
3. State that respondent's perceptions are being sought and contribution is highly valued
4. Reminder of confidentiality/anonymity terms and other relevant ethical matters
5. Ask for participant consent and signoff

Background Information

Q1: What is your job title?

Q2: Can you briefly describe your role in LIT?

Q3: How long have you been in this role?

Q4: How long have you been in LIT?

Theme A: Knowledge Sharing

Q1: What is your understanding of a "knowledge-sharing" culture?

- How would you recognize one?

Prompts: characteristics/interaction between staff (casual/formal)/horizontal and vertical structures

Q2: Do you think that we have a knowledge-sharing culture within LIT?

Prompts: examples/areas

Q3: Do you think that a knowledge-sharing culture would be beneficial to you in your job or your personal development?

Prompts: learning from others/finding information

Theme B: <u>Communities of Practice</u>

Q1: Do you know what communities of practice are?

- Have you ever been a member of one?
- How did you find the experience?

Prompts: explain the concepts if not well understood

Q2: Are you aware of any existing communities in LIT?

Q3: Do you think communities of practice would be beneficial to you and to LIT?

Prompts: ideas/new courses/research/sharing experiences/teaching practice

Theme C: <u>Enterprise Social Networks</u>

Q1: What is your understanding of an enterprise social network?

- Do you use social media outside of work?

Prompts: explain the concepts if not well understood (use Facebook as example)

Q2: Do you think that having an LIT social media platform for staff knowledge sharing is useful?

Prompts: virtual/online v face-to-face

Q3: What conditions would have to be in place for you to use the ESN extensively?

Prompts: lots of users/loads of content/led by management

Q4: Have you any concerns about using social media at work?

Prompts: security/trust/privacy

- Are there other reasons why you would not use such a system at work?

Conclude by asking if there are any other issues that participants wish to raise.

Reiterate the points on anonymity and confidentiality.

Inform interviewee that they will have access to transcript of interview for review.

Niall Corcoran   niall.corcoran@lit.ie   087 2324850

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Section 3

DISCUSSION, CONCLUSIONS & RECOMMENDATIONS

3.0 Introduction

The data analysis produced a number of findings which are presented in Paper 4 of the Research Paper Series. These findings largely support the theoretical assumptions used as a basis for the development of the Conceptual Model, shown in Figure 1, but also add further understanding such that the model can be refined for use in further studies and in different contexts. These findings are presented in relation to the research questions, and accordingly are grouped into categories of antecedents for knowledge sharing, the dominant problems associated with knowledge sharing, the key motivators for knowledge sharing, and the perceived organisational and individual benefits accruing from knowledge sharing. It should be clarified that knowledge sharing in the context of this study is primarily taken to describe the knowledge sharing environment that was developed during the Action Research (AR) project, and includes virtual Communities of Practice (vCoP) facilitated by Enterprise Social Networking (ESN).

Figure 1. Conceptual Model
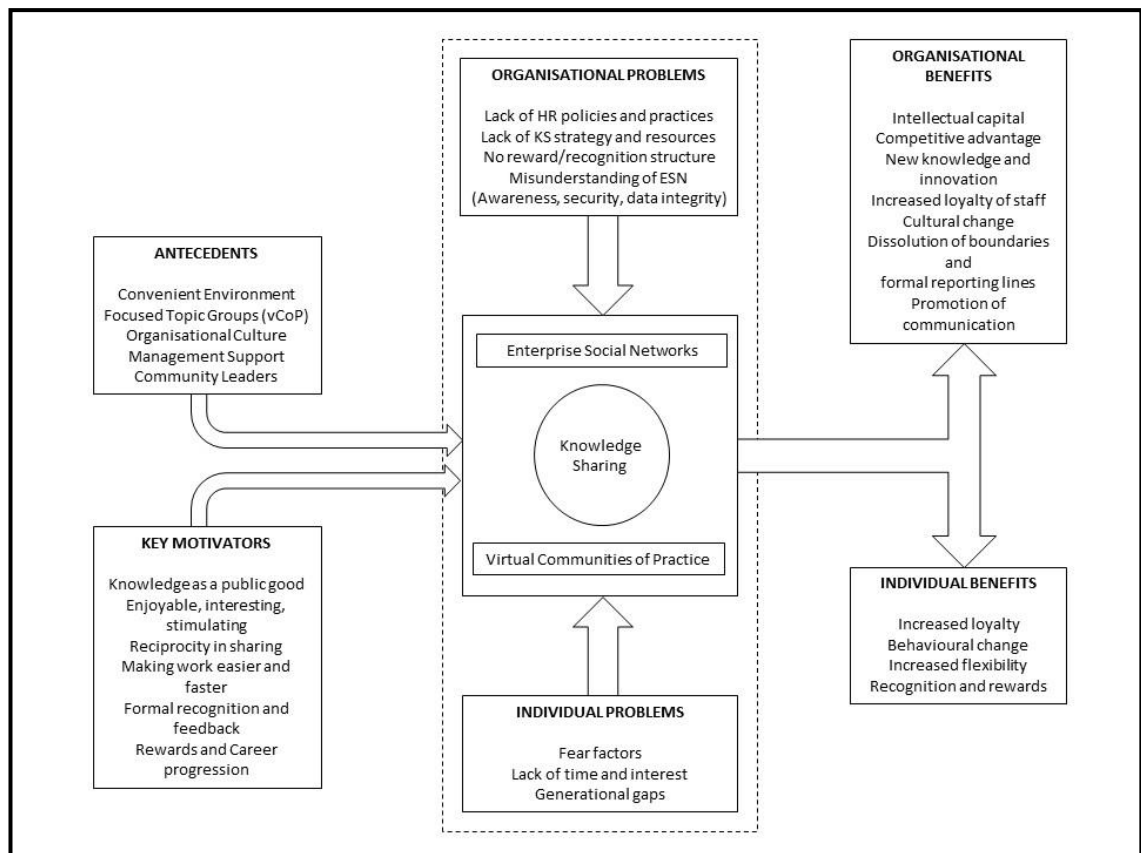
For the purposes of the discussion, I feel that a coherent approach is to take the key findings from the AR study and to discuss these in relation to the literature and my

reflective journal, using other findings to support them as appropriate and to synthesise solid arguments that may highlight implications for practice and lead to suggestions for further research. The key findings synthesised from the overall findings presented in Papers 3 and 4 of the Research Paper Series are presented in Table 1, and are mapped to the relevant research questions (see Paper 2). The complete findings are summarised in Paper 3: Table 7, and Paper 4: Tables 7, 8, 9 and 10.

Table 1. Key Findings

No.	Finding	RQs
1.	Organisational culture and structure are major barriers to staff knowledge sharing in LIT.	2
2.	The existence of a divide between faculty and staff in LIT inhibits collaboration between them in vCoP.	2
3.	Management have a central role to play in shaping the knowledge sharing environment, by leading change initiatives and promoting the use of ESN and vCoP as KM strategies.	1
4.	The existence of vCoP, supported by an ESN, are essential to build a successful knowledge sharing environment.	1
5.	Community leaders and champions are pivotal to the success of vCoP and the ESN, because they are instrumental in helping the user base reach a critical mass.	1
6.	Staff must be suitably motivated to participate in the knowledge sharing environment. Motivation is heavily influenced by the prevalent culture, and a change in culture may impact motivation.	4
7.	The perceived organisational and individual benefits indicate that the development of a knowledge sharing environment should be a priority for management and reflected in organisational strategy.	3

These findings are highly interdependent and heavily influence each other (Figure 2). For example, according to Schein (2010), organisational culture and leadership are two sides of the same coin and neither can be really understood by itself. Therefore, although the themes of the key findings are discussed independently, there is a considerable amount of overlap between them. The findings are critically assessed in light of the earlier reviews of the source literature using the connections and interdependencies between them to develop the study's conclusions.

3.1 Discussion

The creation of an active and vibrant knowledge sharing environment in an organisation, which is underpinned by current social media type tools, requires the consideration of a number of different elements. In the first instance, the selection and implementation of

the technology is important. However, this study has shown that there are very few technical barriers to a successful ESN implementation and the data indicates that staff in general have no issues with using the technology, apart from some connotations associated with the terminology of social media and enterprise social networks discouraging some staff from doing so.

Figure 2. Interdependencies of Findings
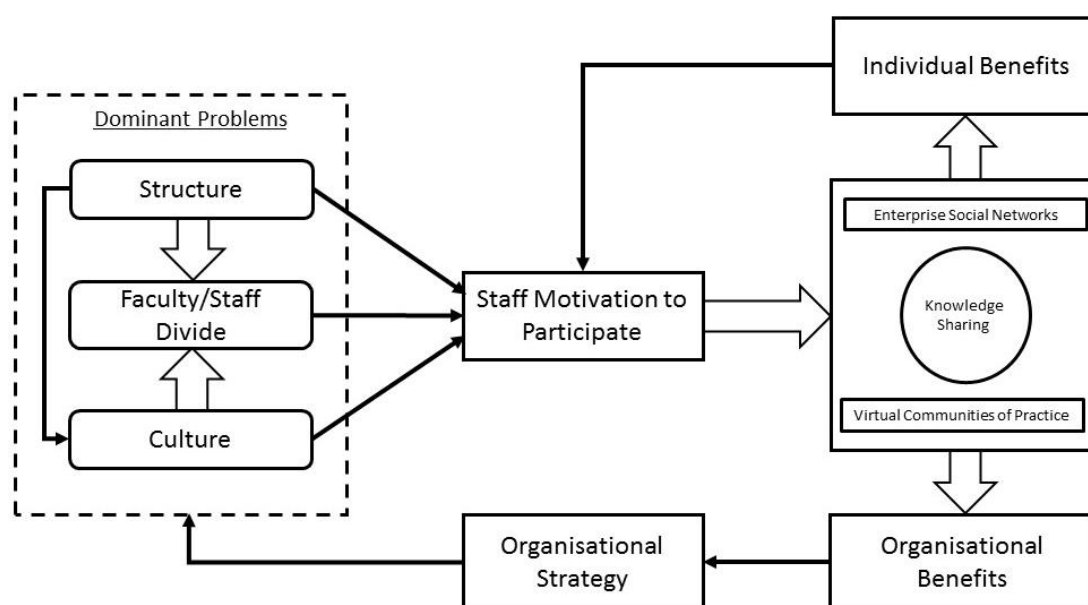
The findings indicate that the willingness of staff to share knowledge and participate in ESN and vCoP is influenced by a number of factors, almost all of which are inexorably linked to the culture of the organisation. This organisational culture in turn is influenced by a number of factors over time such as the structure and hierarchy prevalent within the organisation, the attitudes and actions of management, and the organisational strategy. For example, it is widely recognised in HEIs, and indeed in the wider public sector, that organisational structures encourage the creation of silos and lead to staff isolation (Bannister, 2001; Tippins, 2003). Organisations that can create an open and transparent culture help to make employees feel empowered and have a voice, making them feel more connected and loyal to the organisation (Trice and Beyer, 1993; Lok and Crawford, 2004). The findings indicate that management has an important role to play in helping to change the culture through developing and implementing organisational strategies that stimulate an active knowledge sharing environment. However, a number of authors argue that managing cultural change is difficult and that a natural change of culture is more likely, taking place through the socialization of new staff over time (Sathe, 1983; Pascale, 1985),

and Ogbonna and Harris (1998) argue that attempts at culture change should focus on means of perpetuation such as communications. The study findings indicate that the development of a common understanding of the organisation's mission and goals can be achieved by the creation of a robust social, communications and collaboration framework. It is also possible for culture change to be led through a bottom-up approach, where pockets of excellence and influence can have a significant impact on the overall behaviour of the organisation, through individuals described by Pascale and Sternin (2005, p.72) as "positive deviants", and these can be likened to the roles of community leaders and ESN champions.

Although most staff are motivated to participate in a knowledge sharing environment and recognise both the individual and organisational benefits of doing so (see Paper 4, Table 9), in many cases they are either unable or unwilling to break free of the boundaries that the organisational culture places around them. In the context of higher education institutions, this is exacerbated by the existence of a divide between academic and other staff in the organisation, and again this is supported by the study findings. The findings also indicate that in some cases, staff will participate in the knowledge sharing environment and share knowledge willingly and freely if a convenient (online) and meaningful environment is created for them to do so, and they are suitably motivated. The presence of vCoP in this environment is crucial as a motivation for participation as these can help to break down the structural and cultural boundaries that inhibit knowledge sharing. In order to sustain the development of vCoP and build vibrant communities that will appeal to members and attract new participants, the roles of community leaders and ESN champions are vital.

3.1.1 Organisational Culture and Structure as Barriers to Knowledge Sharing

The study findings indicate that organisational culture has a complex and crucial relationship with the knowledge sharing activities of the organisation. There are almost as many definitions for organisational culture as there are studies on the topic, with almost every piece of literature providing its own definition. Huczynski and Buchanan (2001, p.624) define organisational culture as "the collection of uniform and relatively enduring values, beliefs, customs, traditions and practices that are shared by an organisation's members", characteristics that Schein (2010) describes as "invisible" to distinguish them from "visible" characteristics that influence culture such as buildings, structures, practice

and procedures. Hislop (2013) finds this definition particularly useful as it highlights the collective and shared nature of organisational culture, where all employees are influenced by it, and also because the idea of culture exists at the level of ideas and values which has an influence on behaviours.

The link between organisational culture and knowledge sharing, and specifically the willingness of staff to participate in knowledge sharing initiatives and activities, has been the subject of much research in the knowledge management field (e.g. DiMicco *et al.*, 2008; Annabi and McGann, 2013). It is generally argued that organisational culture can significantly influence knowledge sharing activities and according to Hislop (2013), most of these studies suggest that it can have a positive influence on knowledge sharing. However, a number of studies highlight the negative impacts that certain organisational cultures can have on knowledge sharing activities (Lam, 2005; Rai, 2011; Suppiah and Singh Sandhu, 2011). Alavi *et al.* (2005) suggest that positive cultural values such as openness, sharing and trust will lead to positive knowledge sharing behaviours, and negative values will lead to dysfunctional knowledge sharing behaviours. Therefore, if an organisation wishes to develop an active and useful knowledge sharing environment in which staff openly and freely collaborate and share knowledge, it is necessary for it to understand what type of an organisational culture it has. Although this may sound like a straightforward process, in practice it can be difficult to achieve, and Ogbonna and Harris (1998) conclude that management's view of what the culture is may not be shared by other members of the organisation. Management and staff may also disagree on the rationale for change and this can have a negative influence on the change effort.

There are a number of organisational culture types identified in the literature, such as Cameron and Quinn's (2005) widely cited classification of clan, adhocracy, market and hierarchy cultures (Figure 3), and in examining the links between leadership and organisational culture, Bass and Avolio (1993) usefully classify organisational culture into two distinct types: transactional and transformational. A transactional organisational culture can be closely linked to a hierarchical organisational culture type and these are rooted in formal organisational structures, processes and procedures, and tend to dominate public sector organisations and HEIs. According to Bass and Avolio (1993), a transactional culture focuses on everything in terms of explicit and implicit contractual relationships, and is characterised by staff with short-term interests working as independently as possible from colleagues, and having little identification with the

mission and vision of the organisation. This results in a mechanistic organisation with much attention to controls, directions and standard operating procedures. Little gets done that is not as a consequence of formal agreements, and risk-taking is avoided resulting in little or slow progress and change. This is described as a "strong culture" by Denison and Mishra (1995, p.215), with a high degree of separation between management and staff, and where open and frank discussions between levels in the hierarchy are discouraged. According to De Long and Fahey (2000), this helps to create a context for communication that undermines effective knowledge sharing. The findings from this study clearly demonstrate that LIT has a strong culture, and is firmly in the hierarchy quadrant of the Cameron and Quinn (2005) model with a wholly transactional organisational culture.

Figure 3. Competing values model of organisational culture types (Cameron and Quinn, 2005)
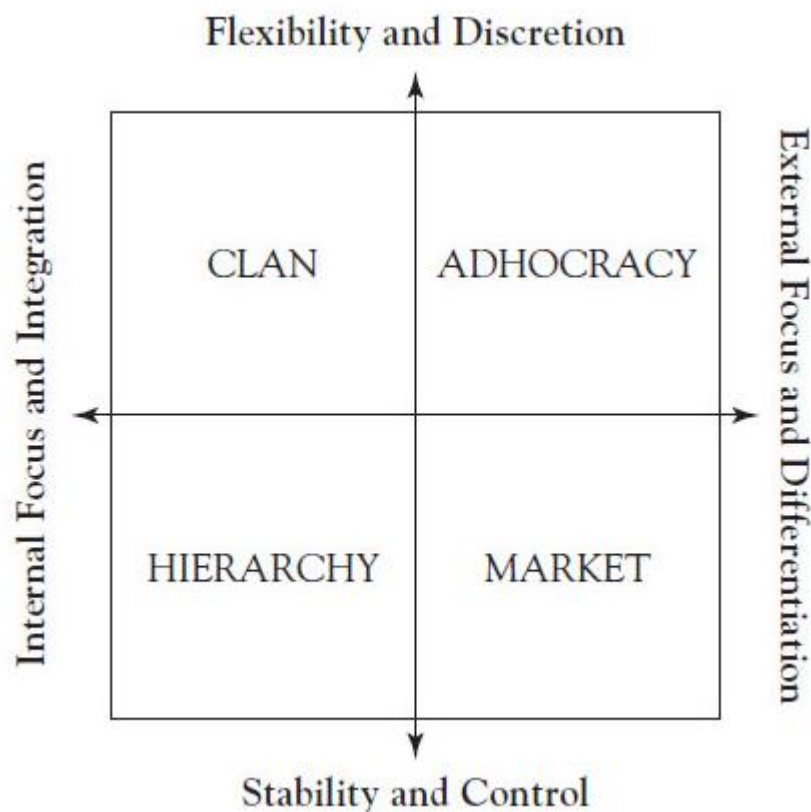
The Conceptual Model (see Figure 1) highlighted the necessity of having an appropriate organisational culture as an antecedent of a successful and active knowledge sharing environment. For example, Annabi and McGann (2013) conclude that organisations must adopt a knowledge sharing culture that recognizes the value of informal knowledge sharing in vCoP using social media tools, and Zboralski (2009) highlights the need for

having an encouraging environment and culture where knowledge sharing is promoted. The existence of a transactional culture as the dominant culture in the organisation suggests that the development of a successful knowledge sharing environment is not possible. Although the AR project led to the creation of a number of vCoP and some growth and sustained use of the ESN, this could not be extrapolated as a successful implementation across the organisation. For this to happen, the organisational culture needs to move towards what Bass and Avolio (1993) describe as a transformational culture, where employees go beyond their self-interests or expected rewards for the good of the organisation. Such organisations are flexible, adaptive, dynamic, informal, and place much emphasis on the potential of its individual employees to grow and improve the organisation. However, a number of authors promote a cautionary approach to attempting to introduce such wholesale culture change. For example, Willmott (1993, p.541) argues that by trying to give employees more autonomy, organisations may "promote a new, hypermodern neo-authoritarianism" which may be "more insidious and sinister than its bureaucratic predecessor".

Transactional cultures are promoted by rigid organisational structures which tend to be stable, centralized and tight, with a very clear, top-down chain of authority, and in which employees have little discretion and are directed and controlled. The work environments are formal and structured and procedures, rules and policies keep the organisation together with the goal of functioning efficiently. Such organisational structures tend to be the norm in public sector HEIs and have been in existence in the same format with little change since their foundation. Much HEI strategic vision and rhetoric is given to the desire of such organisations to be dynamic in operation and responsive to the needs of their markets and customers. However, it is not feasible for large public sector HEIs to suddenly develop loose, decentralized, flat structures that are common in innovative and creative private sector firms, not least because such organisational structures are largely mandated by government policy and applied at a national level (McCarthy, 2014). Therefore, in accepting that organisational structures cannot be readily changed to create the conditions that would help the development of a transformational culture, we must look for other ways within the existing structures for this to happen.

The geographical dispersion of LIT over several campuses across a large geographical area adds to the structural complexities in this case, with each campus almost operating as a separate entity (see Paper 4, Table 8). Although the knowledge sharing environment

offers a convenient means to collaborate and communicate across the organisation, multi-campus participation in vCoP was found to be limited. A number of campuses were added as a result of a merger between two HEIs and this has added to the complexity of the overall organisational structure, which in turn has had a negative impact on the culture of the new, larger organisation. One of the HEIs, Tipperary Institute, was a much smaller, tighter organisation than LIT and it had an open and sharing culture. The predominant transactional culture of the larger organisation has now permeated the smaller organisation and stifled any knowledge sharing activity that was taking place there. This was highlighted during the study by the absence of participants from the Tipperary campuses in vCoP participation and general ESN use, reflecting a lack of physical interaction and communication between staff on different campuses, even within the same departments. Although there is an extant body of research into HEI mergers in a number of jurisdictions (e.g. Eastman and Lang, 2001; Johnes, 2014), there has been little investigation into using KM techniques and tools, such as CoP and ESN, to help in the merger process by facilitating staff communication, interaction and collaboration.

LIT exhibits a strong, hierarchical organisational culture, which is driven by a rigid and bureaucratic organisational structure, largely mandated by national policy. Further complexity is added by the geographically dispersed, multi-campus organisation of the institute. A move towards a transformational culture would enable LIT to develop into a flexible, dynamic and adaptive organisation.

3.1.2 The Faculty Staff Divide

The organisational culture in HEIs is strongly influenced by the nature of what they do, which is to teach and conduct research, and any other activities conducted by HEIs are secondary to these. The delivery of teaching and research is the bailiwick of academic staff who are employed by HEIs to teach and research in specific cognitive domains according to their expertise. The activities of these faculty staff are supported by a host of other staff, such as administrators, counselors, disability-services providers, financial aid staff, IT support staff, librarians, registrars, technical staff or any number of other positions, without which a complex organisation like a HEI could not operate. The existence of a divide between these two groups provided some of the impetus for this research as I sought ways to get them to collaborate and communicate more effectively. The assumption that there was a divide to begin with was made on the basis of

professional experience but is also strongly supported in the literature (Conway, 2000; Szekeres, 2004; Whitchurch, 2006; Dobson, 2011; Fullwood *et al.*, 2013). This assumption is also supported by the study findings, although the divide has different levels of perception among both groups, with 75% of staff describing it as an important issue, compared to just 10% of faculty, although all participants recognize that the organisation is 'siloed'. This suggests that these two groups have different levels of engagement with the organisation and different loyalties to it. The culture of faculty, in which they regard themselves largely as independent contractors on loan from their disciplines, implies a different focus of loyalty than the culture of staff, who regard themselves as employees of the college. The findings suggest that staff have a greater sense of belonging to the organisation, indicating that they are more sensitive to the perceived divide between them and faculty. This is not helped by the nomenclature around their positions, which are invariably referred to as "non-academic", and certainly in LIT, Management and Human Resources (HR) insist on using this terminology, although this is largely led by national and even international norms (Conway, 2000). However, it is not helpful to define a role by saying what it is not, and HEIs should concern themselves with inventing more positive ways of describing staff roles, perhaps beginning with what they actually do. A number of authors have suggested alternatives such as "general staff", in common usage in Australia, or simply "administrators", in common usage in the USA (Conway and Dobson, 2003; Whitchurch, 2006; Sebalj *et al.*, 2012).

The academic staff divide contributes to the fragmentation of the organisation and exacerbates a culture that limits opportunities for staff interaction, collaboration and knowledge sharing. There are many highly qualified staff working in administration and support roles that could significantly enhance the teaching and learning experience of students if they were given the opportunity to collaborate on course delivery and research, and there are many faculty that have expertise that could greatly contribute to the efficient running of the organisation if they were consulted and engaged by management. This rarely happens in practice (Deem, 1998; Rowland, 2002) and there is little evidence of any such collaboration in LIT. Providing an alternative view, Whitchurch (2006) points to the emergence of a project domain in HEIs, characterised by major multi-functional projects that work across what were previously very clear lines of demarcation. For example, student support projects involving administration personnel working with

faculty to provide supports for vulnerable students, and business enterprise projects involving managers and faculty involved in knowledge transfer, innovation and consultancy, are cross-functional. Whitchurch (2006, p.7) goes on to describe a group of staff as "multi-professionals", typically managers who have a lack of pretension and status consciousness, and display a spatial awareness that takes them outside of functional silos. However, the study found little evidence of the existence of either project domains or multi-professionals in LIT, although the potential for the emergence of both is strong. For true project domains and multi-professionals to emerge in the organisation, an awareness of the organisational culture is necessary, because multi-professionals place more emphasis on the cultures of their institutions than on management structures. Whitchurch (2006) maintains that they don't see themselves in a typical service role, but rather they reflect on how they might operate within the organisational culture to facilitate organisational learning and development, generating an atmosphere where faculty might feel empowered to try different things.

The study found that a number of vCoP have both faculty and staff membership, and both groups seem quite happy to freely share knowledge and collaborate within their vCoP. This indicates that the knowledge sharing environment can provide a means for faculty and staff to collaborate on areas of common interest and help to bridge the divide that exists between them. For this to happen in a meaningful way, and on a scale that can influence a shift towards a transformational culture within the organisation, it requires management to recognize the existence of the academic staff divide and its impact on knowledge sharing and collaborative activities. This is not to say that a sudden recognition by management that the organisation has particular cultural traits that cause the divide, and addressing these will be a panacea for all the ills of the institute. Tierney (1988) cautions against such an approach and proposes a framework to diagnose culture in HEIs so that distinct problems can be overcome. Taking such an approach will allow strategies to be put in place to help to bridge the divides and treat all staff of the organisation as equals. According to Florenthal and Tolstikov-Mast (2012), the culture of a HEI has a significant influence on the overall education experience of its students, and a strong sense of community amongst staff is critical to achieving a strong organisational culture. This sense of community can only be created in the presence of strong working relations between faculty and staff. The choice then for management is to find opportunities to get faculty and staff to work together in meaningful ways or to perpetuate

a divide that simply does not help students or the organisation in any way. The study findings indicate that when the right collaboration opportunities are presented to faculty and staff, they will collaborate and communicate with each other. This suggests that having a knowledge sharing environment complete with vCoP as a central knowledge management technique, and supported by ESN, should be at the heart of organisational strategies that seek to improve staff communication and knowledge sharing in order to drive organisational efficiencies. This view is supported by Bertels *et al.* (2011) in relation to CoP, and Richter *et al.* (2013) in relation to ESN.

Both the prevalent organisational structure and culture contribute towards a divide between faculty and staff. This divide limits opportunities and motivations for staff to interact and collaborate with each other, resulting in reduced operational efficiency and lost opportunities for the organisation. When satisfactory opportunities are provided for collaboration and motivational issues are addressed, this divide can be bridged and faculty and staff will work together. Such opportunities can be delivered through the knowledge sharing environment and should be central to organisational strategies.

3.1.3 The Role of Management

The attitudes, actions and behaviours of leaders and managers have an important role to play in the context of knowledge sharing in HEIs. In organisations in general, Bircham-Connolly *et al.* (2005) suggest that leadership has a pivotal role to play in promoting and cultivating knowledge sharing behaviour, mainly by providing opportunities for and managing the processes for staff to share and transfer their knowledge. According to Wang and Noe (2010), when management is supportive of knowledge sharing, employees perceive that a knowledge sharing culture is prevalent, indicating that leadership is highly significant in this regard. However, Yielder and Codling (2004) maintain that the role of the leader can be quite different in HEIs than in other forms of organisation, describing two types of leadership: academic and managerial. Academic leadership highlights attributes of knowledge, professional recognition and expertise, personal qualities and team acceptance, contributing to a personal power base. In contrast, managerial leadership is based on hierarchical position, job responsibilities, control and authority, and power is vested in the position rather than in the individual. According to Fullwood *et al.* (2013), managerial leadership is associated with the corporate style model that many HEIs are moving towards.

Leadership and management styles are closely interconnected topics and their relationship can have a significant impact on knowledge management initiatives (Hislop, 2013). Most of the literature argues that certain leadership styles and organisational cultures can support and facilitate knowledge sharing activities. However, the study findings indicate that the prevailing organisational culture and the existence of a faculty staff divide have a negative impact on the willingness of staff to participate in knowledge sharing initiatives. This suggests that the organisation needs to move along the line from a transactional towards a transformational culture if staff collaboration and communication is to improve. In order to achieve this and include such ambition in corporate strategies, from where it can be enacted, management should try to understand that these issues really do exist in their organisations. Secondly, a recognition that a cultural change, engendering an active and vibrant knowledge sharing environment, may have the potential to solve these issues, would be helpful. Such a change may bring about increased staff effectiveness, morale and loyalty, improve operational performance, and increase intellectual capital and competitiveness. Although this study has established that such an understanding, and leadership, are crucial to implementing successful knowledge sharing initiatives, the question arises: how does this understanding come about if it does not already exist? It may be argued that this understanding can be encouraged through a bottom-up approach. Any organisation will have a number of people who have the personality to see knowledge as a public good and are willing to openly share and freely collaborate with colleagues. Most ESN initiatives start with an IT services department, because they are initially seen as just another IT tool. However, once such staff discover that the ESN lends itself very well to supporting vCoP, communities will begin to emerge. It is through recognizing the success of some of these communities that management begin to take notice of their activities and find out more about them.

Once this process begins, the chances of developing a successful knowledge sharing community increase dramatically. However, it is vital to find executive sponsors for this to happen. Without executive sponsors, it is likely that managers will boycott the tools, or communicate their doubts and concerns to their teams, probably arising from a lack of understanding, ultimately discouraging use. This can be as simple as finding an executive who is willing to start an online group to facilitate communication and collaboration within their own department. Having senior management participation can also help to erode the stereotype view of management held by many staff and encourage them to

engage with communities and the ESN. According to Wi (2015), management participation is crucial for successful collaboration to happen within organisations. Leaders are aware that they should engage with employees, and particularly through social and digital channels, but they tend not to. There are a number of reasons for this including fear that such engagement would result in a weakening of power relations, reducing their ability to control and command. Wi (2015) maintains that collaboration depends on trust and leaders must learn how to trust their staff on platforms such as an ESN, although the tools themselves are not as important as managements' understanding of the purpose and nature of the tools. Using platforms such as ESN requires organisational change, and that change generally needs to be led by management. This requires visionary leadership, defined strategic objectives, and a commitment to lead the organisation through the necessary change. Kezar and Eckel (2002, p.457) find a strong relationship between organisational change and culture in the context of higher education, and that leaders who are acting as organisational change agents must become "cultural outsiders" in order to understand their own cultures and their impact on change initiatives, through examination and reflection.

Fidelman (2012, p.3.6), refers to the change in culture as organisations becoming "social businesses", and this requires a new strategy, which takes "time, persuasion, planning, teamwork, and measurable goals". It is suggested that this process is quite difficult for bureaucratic and hierarchical organisations of which HEIs are typical examples. This may also be exacerbated by the requirement in HEIs for a different set of leadership skills than required by business, and Spendlove (2007) finds that HEIs have no organisational strategies for identifying or developing leadership skills. However, once the value to the organisation has been recognized, a vision for a knowledge sharing enterprise and the expected outcomes can be provided. Following this, a community management plan can be established where the people, processes, resources and technology are provided to support the vision. Lastly, the execution of the plan requires the identification of leaders and champions within the organisation who will help to promote the vision and the changes associated with it. According to Zboralski (2009, p.94), establishing a "knowledge management friendly atmosphere", which includes the active promotion of CoP, will increase employees' awareness of the need to share knowledge and will encourage CoP participation.

The execution of a strategic vision for a knowledge sharing environment requires a number of practical implementations, such as the development of HR policies and practices which support the utilization of ESN for knowledge sharing. This can be helped by management making a connection between the functionality of these tools and a knowledge sharing strategy. HR themselves can also take a further role in embedding the ESN into the organisation if they recognize its value in helping to onboard new staff through the provision of online peer and mentoring support, the lack of which this study has highlighted as an issue. In terms of resources, the ESN itself does require both technical support and some level of management, distinct from community management. Training resources for ESN use and vCoP establishment, participation and management should be provided and available on an ongoing basis, both in structured and online forms. Although, rewards and recognition do not present in this study as strong extrinsic motivators for staff participation, management might give some consideration to reward and recognition structures as incentives for participation, perhaps through conference and seminar attendances or simple acknowledgement schemes (see Paper 4, Table 9). An additional consideration may be to the allowance of time for staff to participate in knowledge sharing activates such as vCoP, as the findings from this study indicate that time is one of the largest individual barriers to participation (see Paper 4, Table 8).

The findings imply that middle management has a pivotal role to play in the development of knowledge sharing initiatives and their attitudes and behaviour will have a direct impact on staff participation (see Paper 4, Table 7). This is supported by Huy (2002), who investigated the emotional commitment to organisational change by middle managers, and Ogbonna and Wilkinson (2003), who investigated the impact of cultural change initiatives on middle managers. It is suggested that managers with creative abilities are more likely to recognise the potential of ESN and vCoP and promote their use within their own departments and amongst their staff. In contrast, strictly operational managers are more likely to see the ESN as another IT tool that has to be negotiated and could potentially hinder participation through discouragement and negativity. Having an active executive sponsor can go some way towards mitigating against this situation, and increasing awareness through training and information sessions for middle managers can also help in this regard.

The distinction between creative and operational managers can be associated with the different culture types of transformational and transactional, and this terminology can be

applied to leadership styles (Basham, 2010). According to Thite (2000), transactional leadership represents most of the existing theory on leadership styles and is associated with contractual agreements between leaders and staff, in a 'cost-benefit exchange process leading to ordinary outcomes'. The management levels of public sector organisations, such as HEIs, with rigid bureaucratic structures mandated by the state, tend to be staffed with operational managers, and this contributes to a transactional culture (Zeffane, 1994; Parry and Proctor-Thomson, 2002). This is characterised by leaders who define clear goals and objectives but with a short term scope, and who have no real interest in changing the culture or environment unless they are forced to do so if problems occur (Basham, 2010). The study findings indicate that purely operational managers may miss or misunderstand the perceived benefits of a knowledge sharing culture because they are entirely focused on metrics as the outcomes of sharing knowledge. They are only concerned with tangible and measurable short-term benefits to the organisation and may fail to recognise longer term benefits to the both the organisation and individuals that will accrue from increased staff interaction and collaboration, such as increased staff loyalty, and would have little sense of the idea of a learning organisation.

According to Basham (2012), transformational leadership is essential in higher education so that institutions can adapt to constantly changing academic and economic environments. Transformational leaders firstly recognise that a change in culture is necessary and then seek to promote change and development within the organisation. Bass and Avolio (1993) argue that transformational leaders will try to develop cultures that are conducive to creativity, problem solving, risk taking and experimentation, and Lam (2002) found that transformational leadership has a positive effect on emphasising and encouraging teamwork, spirit and involvement of staff. These traits are the hallmarks of organisations with high levels of staff collaboration and interaction where knowledge is freely shared. Organisations such as public sector HEIs are slow to change and it is unlikely that the culture of these organisations will see a dramatic shift from transactional to transformational in the short term. This suggests that managers must combine the qualities of transactional and transformational leaders in order to engender a knowledge sharing culture. This is supported by Nguyen and Mohamed (2011), who conclude that the success of knowledge management initiatives is dependent on the abilities of leaders to balance transactional and transformational behaviours. Transactional behaviours will follow the established norms, values and procedures, whereas transformational

behaviours will allow managers to adapt the organisational culture to facilitate greater staff knowledge sharing and collaboration. However, according to Leslie and Canwell (2010), effective leadership can be stifled in organisations that are unnecessarily complex and inflexible. McCarthy (2014) maintains that the manner in which public sector organisations operate is dictated by demands of public accountability and an intense media scrutiny. This permeates the organisational culture and limits the capacity of individual leaders to pursue new approaches and adopt responsive service innovations. McCarthy (2014) also states that the structure of the public sector and its bureaucratic form adversely impacts the effectiveness of leadership, and risk taking, creativity and innovation are stifled and discouraged. Leaders that operate within the public sector are characterised by being risk averse and conservative, when what is really needed is leaders that are more innovative and creative.

The role of management in the development of the knowledge sharing environment is of significant importance, from executive sponsorship of ESN and community strategies, to providing encouragement and support to other staff through leadership and participation. Managers that have creative or transformational characteristics are more likely to recognise the value of KM initiatives such as vCoP and ESN and promote their use, and this is particularly applicable to middle management.

3.1.4 Virtual Communities of Practice

According to Bolisani and Scarso (2014), the concept of CoP as a knowledge management technique has been widely applied by companies in practice in order to promote knowledge sharing amongst employees to improve business performance. Hislop (2013) maintains that the CoP literature universally considers them to be beneficial for both organisations and individuals. Wenger (1998) describes CoP as self-organising and self-sustaining entities that can spontaneously emerge in organisations from the willingness of people to share knowledge and expertise. Further, CoP are not created by management but are seen as groups that are created by the joint efforts of individuals for their own purposes. According to Lesser and Storck (2001), the traditional idea of a CoP is that it emerges from a work or interest related topic and its members volunteer to join. The study findings indicate that vCoP can and do emerge from the bottom-up, through the efforts of individuals who are interested in particular subjects and who seek out colleagues with similar interests in order to share their knowledge and experiences and

learn from each other (see Paper 4, Table 9). vCoP are also more likely to emerge, and in greater numbers, because of the relative simplicity of their creation compared to traditional CoP, which is facilitated by the ESN platform. The findings also suggest that for genuine social interaction to take place in vCoP, they need to be relevant, purposeful and appealing in order to stimulate a real desire or need to engage. The knowledge sharing environment also needs to be in tune with the ways people interact on the social web, which embody the underlying open ethos that people enjoy, rather than be a forced environment for conversations. To facilitate this, the selection of the ESN is important, and it must provide an interface and functionality that people expect from a social media platform. This rational had a significant influence on the selection of Yammer for this project, as it bears many similarities to common social media platforms such as Facebook and Twitter. The provision of a familiar tool has dual benefits of making the system more attractive to users, and reducing the need for extensive training on the platform itself. It does not, however, reduce the need for training in vCoP, which is essential to provide members with a complete understanding of what communities are, how they operate, and to provide a set of guidelines or a framework to work within.

Hislop (2013) states that CoP provide staff with a sense of collective identity and this is supported by the study findings where staff who expressed feeling a sense of detachment from the organisation felt that participation in vCoP would give them a better sense of engagement and identification with it. As CoP are based on shared professional interest and commitment rather than on projects or organisational position (Alavi *et al.*, 2005), they provide opportunities for staff members from different departments and disciplines to interact on areas of common interest, and importantly, provide an environment for faculty and staff to interact in ways that would otherwise most likely not arise. A number of study participants felt that vCoP have the potential to break down the social divides and eliminate the silos that exist in the organisation. Given that CoP are generally considered to be autonomous, self-managing systems that can successfully exist without the need for management creation or support (Baumard, 1999), the question arises as to what role management has in engendering a CoP based knowledge sharing environment. Management attempts to control and influence a vCoP included in this study were poorly received by its members and caused a temporary suspension of activity in the community. Some participants also expressed fear of participating in a vCoP because they felt that their managers would not see it as adding any value to their roles and would not support

them. Therefore, if vCoP are adopted as a strategic initiative in the organisation, it is important that managers understand their nature and provide the necessary supports for them to develop, rather than trying to control them or subjugate them for their own purposes.

The adoption of vCoP as a KM strategy has the potential to improve collaboration and interaction between staff in the organisation. vCoP must be relevant, purposeful and appealing for staff to participate in them. Although CoP can and do emerge from the bottom-up, their growth is helped by a positive approach from management that fosters a sustaining environment where they can flourish. The ESN presents additional benefits, particularly by presenting a convenient and always-on environment for collaboration, and providing a relatively straightforward means for anyone to establish vCoP.

3.1.5 Community Leaders and Champions

Analysis of the ESN content for a number of vCoP indicate that the role of community leader is a critical one for the vitality of a community (see Paper 3, Table 7). According to Borzillo *et al.* (2011), community leaders are specific people within a community who undertake organising roles with the objective of developing and sustaining the community. In many cases, they are the founders of particular CoP and are generally the driving force behind them. The vitality of CoP are very dependent on the interest and commitment of their leaders, and communities that do not have dedicated leaders are bound to fail. Zboralski (2009) states that community leaders are responsible for motivating other members to participate, coaching new members, and organising and advertising community events, and the more attention that is paid to these tasks, the more intensive the activity of the CoP will be. However, it is the most demanding and time-intensive role in a community and community leaders must be prepared to nurture the development of a CoP, particularly if they are instrumental in establishing them.

Another important role in vCoP is that of champions (see the Preface to Paper 4 for a definition), a role that is increasingly recognised as being central to the growth of an ESN in an organisation (Chin *et al.*, 2015; Oostervink *et al.*, 2016). The study findings show that during the early growth phase of the ESN, the conversations tend to be dominated by a number of individuals who use the technology freely and enthusiastically, and are generally comfortable using social media. This is supported by Hart (2015) and consistent with Rogers (1995) diffusion of innovations theory. Most of them became members of

more than one vCoP on the ESN and participated in discussions in all of the communities that they were in. The findings also suggest that ESN champions have a distinct personality type that inclines them to openly share knowledge with, or to seek knowledge from others, and that the activities of these people have a positive effect on the development of CoP. They take a professional pride in helping people through sharing knowledge and this finding supports the idea that some individuals see knowledge as a public good and will freely share it (McLure Wasko and Faraj, 2005; Hislop, 2013). The identification of these individuals is central to opening up the ESN to everyone in the organisation as they, in conjunction with community leaders, keep conversations and activity within communities at levels that are necessary to attract other users and reach a critical mass for sustainability. It is important to guide champions and make sure they are clear about what being a champion involves, and indeed to make sure that they are comfortable fulfilling such a role, as most are not aware that they might be perceived as champions in the first instance. The role of champions should be clearly identified in an ESN strategy and they should be given adequate supports to fulfil their roles, which may simply be providing them with adequate Information Technology (IT) equipment and connectivity to ensure that they have ready access to the ESN, and training in their role as an ESN champion.

Some authors have compared champions to transformational leaders (Tushman and Nadler, 1986; Stata, 1989), who play a key role by bringing people together through promoting vision and trust. According to Day (1994), they have an ability to navigate through the political and social organisational environment, an ability that is especially important in politically charged organisations such as public HEIs (Rowley *et al.*, 1997). Although people tend to be more creative when they are motivated by interest, satisfaction and challenge, and champions are usually intrinsically motivated by virtue of their character (Howell, 2005), they should be recognised for their contributions and management should be supportive of their activities. Champions operate through strong social networks and these networks are crucial in delivering the success of new initiatives such as an ESN (Jenssen and Jørgensen, 2004). A challenge for organisations is therefore, to identify potential champions and their social networks, and to how to use them to foster the growth of ESN and vCoP. In the development of the ESN, champions should be identified at an early stage and invited to participate. They help to resolve any initial problems and drive the increase of the user base. It is useful if the ESN champions are

drawn from a spectrum of people from across the organisation, including a mixture of early adopters, socially savvy people, contributors, spectators, key users and executives.

The roles of both community leaders and champions are pivotal to the successful development and growth of the knowledge sharing environment through their impacts on vCoP and the ESN. Although, the roles may be filled by the same individuals in a number of cases, both roles have different characteristics that need to be understood. The identification and nurturing of the individuals in the organisation that can fulfil these roles is an important element in any approach to implementing KM initiatives.

3.1.6 Staff Motivation

The concept of staff who freely share knowledge because they see it as a public good has been identified with a particular personality type, and these are the same people who willingly participate in most organisational initiatives without incentive, persuasion or coercion. They are likely to emerge as ESN champions and ambassadors or CoP founders and community leaders. Without this group of people in an organisation, knowledge sharing initiatives are unlikely to succeed. However, this group is also unlikely to be a very large group and its size is more likely to align with what is known as the 90-9-1 rule (Nielsen, 2006) which proposes that in any online participative system, 90% of people are lurkers, 9% are occasional contributors and 1% are regular contributors, so the strongly motivated personality may account for just 1% of a population. More recent studies suggest that a 70-20-10 breakdown is achievable through initiatives and interventions such as strong community management (Schneider, 2011; Hart, 2015), and the participation figures from this study fall somewhere in between these two, indicating that there may be more than 1% who are strongly motivated to participate. However, as the 10% figure for regular contributors is achieved by intervention, it is likely that the size of the highly motivated group remains closer to 1% of a population.

In order to successfully manage the development and growth of the knowledge sharing environment, it is necessary to understand both what motivates the remainder of the staff population to participate and what prevents them from participating. Therefore, motivations for participation must be examined in conjunction with barriers to participation. Enablers and inhibitors to participation from the existing literature were considered during the development of the Conceptual Model (Figure 1) and are listed in Paper 3, Table 1. The study findings indicate that staff are motivated to use the ESN and

participate in vCoP if they either find their engagement to be enjoyable, interesting or stimulating, or if they can derive other benefits from participation, such as making their working lives easier or deriving some rewards in terms of recognition or career progression (see Paper 4, Table 9).

In addition to the cultural barriers that inhibit many staff from participating in the knowledge sharing environment, there are also a number of individual barriers that emerged from the research, some of which were predicted in the Conceptual Model (see Figure 1) and some which were not (see Paper 4, Table 8). The main individual barriers to participation that present in the study, such as fear factors, lack of time and the age profile of staff, have been explored to some degree in the literature. One unexpected finding is that the terminology used to describe the online tools (ESN and social media) can be problematic and puts many staff off participation because they associate social media with frivolity and activities that should not be associated with work. Indeed, many staff see social media as something that should only be used outside of work and do not see any application for it in the workplace. Many participants also had no concept of what enterprise social networking actually is, much less envisage it as a collaboration platform that could be used in the workplace. This problem needs to be addressed in a number of ways. In the first instance, organisations who are developing knowledge sharing platforms based on ESN technology, should consider a re-branding of the ESN with terminology that is more closely associated with community activity. For example, during the course of this project, the overall collective for all of the CoP is called "LIT Communities" and is essentially a portal for the ESN from where staff can navigate existing communities or create new ones. Staff should also be educated about the purpose and use of ESN in the organisation through awareness and training programmes that emphasise the professional aspects of these applications. It is also incumbent on developers of these tools for the workplace to consider the introduction of alternative nomenclature which might be better suited to applications of social media in organisations.

All organisations have a number of staff who are highly motivated and will participate in any initiatives that the organisation introduces. In general, however, this is not a large group, so it is necessary for an organisation to understand how the rest of its staff could be motivated to participate in KM initiatives if they are to succeed.

3.1.7 Perceived Benefits

The study findings show that there is a general perception that participating in a knowledge sharing environment by becoming a member of a vCoP and using an ESN will result in benefits to both the individual and the organisation (see Paper 4, Table 10). This supports the outputs from the Conceptual Model (Figure 1) which were developed from a survey of the literature. The study findings also indicate that there is a perception that a successful knowledge sharing environment can positively influence the organisational culture and lead to a more open, creative and sharing organisation, with an increased sense of belonging and loyalty engendered through participation. However, it should be noted that these are perceived benefits and have not been measured as actual benefits that have been derived from participation. Although, individual benefits can be empirically explored, organisational benefits, such as increased intellectual capital and improved performance, can be difficult to quantify (López-Nicolás and Meroño-Cerdán, 2011; Wang and Wang, 2012).

Much of the CoP literature describes the benefits to the organisation if CoP are adopted as a KM technique, and individual benefits derived from participation are also widely discussed. CoP can also deliver different benefits to different types of organisation. For example, Lesser and Storck (2001) suggest that they have the potential to overcome many of the inherent problems for slow-moving, hierarchical organisations that have to exist in a fast-moving, virtual economy. They are also an effective way for organisations to share knowledge outside of traditional structural boundaries. This suggests that CoP would be a beneficial KM technique for public sector organisations such as HEIs to adopt. However, because communities don't appear on the organisational charts and balance sheets of organisations, they can only be considered as a hidden asset, and this presents a difficulty in determining how exactly they deliver value. This may also present a problem for highly risk-averse organisations, such as public sector bodies, who generally need to be able to quantify a return before making an investment. Rather than attempting to quantify the benefits of a CoP model, a better approach may be to for the organisation to develop an understanding of how CoP can create value. Lesser and Storck (2001) suggest that thinking of communities as engines for the development of social capital would be helpful, and argue that the development of social capital in CoP leads to behavioural change, resulting in greater knowledge sharing, and this in turn can positively influence organisational performance.

Similar to CoP, the benefits of ESN implementation and use for organisations can be difficult to quantify in terms of specific deliverables and direct value. Various consultancy firms make claims such as "effective use of social technologies can result in 20–25% improvement in knowledge worker productivity", which appears in a 2012 McKinsey report (Mäntymäki and Riemer, 2016). Claims of this nature, which are generally neither scientifically nor empirically tested, are not helpful for organisations who are trying to develop an understanding of the benefits that ESN use can deliver. However, there is a growing body of research that argues that ESN can bring many and significant benefits to the organisation through increased communication and knowledge sharing, and increased social capital (Davison *et al.*, 2014; Leonardi and Meyer, 2015). Some recent empirical research furthers this by making positive associations between ESN use and employee performance (Riemer *et al.*, 2015), and finding that ESN can help to overcome some of the barriers to organisational knowledge sharing, such as motivation to share knowledge, and developing and maintaining social ties (Fulk and Yuan, 2013). A long term study into the benefits of the knowledge sharing environment, combining vCoP and ESN use, with a mixed-methods approach using a combination of surveys and interviewing, would further this growing body of knowledge into how adopting ESN and CoP techniques can deliver value to organisations and individuals. In terms of practice, it is necessary to understand that organisational benefits will only materialise through individuals' sustained use of the platform (DeLone and McLean, 1992), and such sustained use will only be achieved by ensuring that the knowledge sharing environment is valuable for the individual user. This further necessitates an understanding of what constitutes value for individuals and how they use the platforms, and further, detailed investigation into these aspects would also be beneficial.

For HEIs, the use of ESN is seen to have the potential to promote communication amongst staff and encourage interaction across functional areas, and between faculty and staff (Schneckenberg, 2009; Zhao and Kemp, 2013). The study found considerable evidence to support this in a number of vCoP that have both faculty and staff members, where there was open discussion that was independent of boundary and reporting lines. A potential organisational benefit that emerged from the study was the opportunity to use ESN and vCoP as on-boarding tools to support new staff. A number of participants discussed the lack of support available for new staff, especially faculty, and felt that participating in relevant online communities would allow them to assimilate into the organisation more

efficiently. In addition, the availability of the ESN as a communications platform would provide them with a space to seek information to help them in their new roles, allowing them a means to tap into the existing organisational knowledge base. The use of ESN in this fashion has been investigated by Leidner *et al.* (2010, p.229), who found that they can immediately increase the sense of cultural belonging to the organisation, make the environment of entry-level workers exciting, and increase morale amongst a "Generation Y" workforce. The provision of such on-boarding supports for new staff should be led and managed by the HR department, and would be enabled by the recognition of its potential by management through inclusion in organisational strategy.

A number of perceived organisational and individual benefits emerged from the study findings. Most importantly, there is a perception that a knowledge sharing environment can have a positive impact on the culture of the organisation, bringing about change leading to a more open, creative and efficient organisation. This in turn has the potential to deliver benefits to individuals, in addition to those that can be derived directly from participation.

3.2 Conclusions and Recommendations

The genesis of this research lies in the frustrations of working in a cultural environment where a lack of communication, interaction and collaboration between staff is commonplace. This environment has a number of contributory factors such as the prevailing structures and culture, and a divide between academic and other staff, all of which combine to inhibit knowledge sharing activities. A knowledge sharing environment was created, using an ESN platform and vCoP as a KM technique, to investigate if staff communication, interaction and collaboration could be increased.

This depiction of the operational environment in HEIs is well supported by the study findings. Although the perception of the divide between academic staff and other staff is more strongly held by the latter group, the isolating nature of the academic role and the fragmentation of the organisation into silos, all contribute towards an organisational culture which limits the opportunities for staff interaction, collaboration and knowledge sharing. The importance of all of the antecedents in the Conceptual Model is supported by the data, with management support emerging as the most critical antecedent, because management must lead change initiatives and promote ESN and vCoP as organisational strategies. The findings show that the majority of the non-management interviewees

viewed management support as being critical to the success of both the communities'
model and the use of Yammer as an organisational communications and collaboration
tool. All of the organisational and individual problems in the Conceptual Model present
to various degrees in the data. In general, the structure of the organisation is recognised
as being a major impediment to the development of a knowledge sharing environment,
and the size and geographical dispersion of the organisation was also highlighted as
problematic in this regard. All of the key motivators identified in the Conceptual Model
are supported by the data. A number of interviewees felt that staff of a certain personality
type are more inclined to openly share knowledge with, or to seek knowledge from others,
and that the activities of these people have a positive effect on the development of vCoP.
This supports the idea of those that see knowledge as a public good being motivated to
share knowledge with others. All of the interviewees were of the opinion that both the
use of ESN and a vCoP model would be of significant benefit, both to themselves in their
jobs and personal development, and to the organisation. Much of the commentary was
aspirational in nature and spoke about a desire for change in the organisational culture
that might arise from the establishment of an active and vibrant knowledge sharing
environment. However, a number of more tangible organisational benefits were also
elucidated, such as the possibility for vCoP to break down the social divides and eliminate
the siloes in the organisation.

In summary, organisational culture and structure are major barriers to staff knowledge
sharing and this is exacerbated by the existence of a divide between faculty and other
staff. Management have a significant important role to play in shaping a knowledge
sharing environment and this can only be achieved through transformational leadership
that recognises the existence of the postulated problems in the first instance, and then sets
about changing the organisational culture to one where staff will openly and willingly
share knowledge and collaborate with each other. The existence of vCoP are essential to
build an active knowledge sharing environment, and community leaders and champions
are pivotal to the success of vCoP and the ESN. In addition, staff must be suitably
motivated to participate in the knowledge sharing environment, and this will only happen
with a change to a transformational culture within the organisation.

3.2.1 Summary of Key Findings

1. LIT exhibits a strong, hierarchical organisational culture, which is driven by a rigid and bureaucratic organisational structure, largely mandated by national policy. Further complexity is added by the geographically dispersed, multi-campus organisation of the institute. A move towards a transformational culture would enable LIT to develop into a flexible, dynamic and adaptive organisation.

2. Both the prevalent organisational structure and culture contribute towards a divide between faculty and staff. This divide limits opportunities and motivations for staff to interact and collaborate with each other, resulting in reduced operational efficiency and lost opportunities for the organisation. When satisfactory opportunities are provided for collaboration and motivational issues are addressed, this divide can be bridged and faculty and staff will work together. Such opportunities can be delivered through the knowledge sharing environment and should be central to organisational strategies.

3. The role of management in the development of the knowledge sharing environment is of significant importance, from executive sponsorship of ESN and community strategies, to providing encouragement and support to other staff through leadership and participation. Managers that have creative or transformational characteristics are more likely to recognise the value of KM initiatives such as vCoP and ESN and promote their use, and this is particularly applicable to middle management.

4. The adoption of vCoP as a KM strategy has the potential to improve collaboration and interaction between staff in the organisation. vCoP must be relevant, purposeful and appealing for staff to participate in them. Although CoP can and do emerge from the bottom-up, their growth is helped by a positive approach from management that fosters a sustaining environment where they can flourish. The ESN presents additional benefits, particularly by presenting a convenient and always-on environment for collaboration, and providing a relatively straightforward means for anyone to establish vCoP.

5. The roles of both community leaders and champions are pivotal to the successful development and growth of the knowledge sharing environment through their impacts on vCoP and the ESN. Although, the roles may be filled by the same individuals in a number of cases, both roles have different characteristics that need to be understood. The identification and nurturing of the individuals in the

organisation that can fulfil these roles is an important element in any approach to implementing KM initiatives.

6. All organisations have a number of staff who are highly motivated and will participate in any initiatives that the organisation introduces. In general, however, this is not a large group, so it is necessary for an organisation to understand how the rest of its staff could be motivated to participate in KM initiatives if they are to succeed.

7. A number of perceived organisational and individual benefits emerged from the study findings. Most importantly, there is a perception that a knowledge sharing environment can have a positive impact on the culture of the organisation, bringing about change leading to a more open, creative and efficient organisation. This in turn has the potential to deliver benefits to individuals, in addition to those that can be derived directly from participation.

3.2.2 Recommendations for Practice

A number of findings have practical implications and can be used by any organisation implementing ESN and CoP as KM strategies, including the development of clear terms of reference and blueprints for CoP, and the development of structured training for both CoP and ESN. Some of the barriers to participation such as lack of time and fear of using social media are also not unique to HEIs, and the findings should be of interest to others who are using social media in a similar fashion. The finding that the terminology used to describe the online tools (ESN and social media) can be problematic should be of interest to developers of these tools in particular, who may wish to investigate the introduction of alternative nomenclature. The use of ESN as a means of improving general communications within the organisation should be of practical interest to management, as should the suggestion that ESN and vCoP could be used as on-boarding and mentoring tools for new staff. The management of HEIs in particular should be concerned with the strong evidence uncovered for the existence of a divide between academic and other staff. The identification of the importance of management support for the establishment and use of ESN for vCoP and knowledge sharing also has implications for management in HEIs who wish to improve their KM capabilities. The implications for practice are summarised in Table 2.

Table 2. Implications for Practice

Conclusion	Implication for Practice	RQ
A transactional organisational culture is a barrier to staff interaction, collaboration and knowledge sharing.	Organisations require a developed understanding of their culture to inform meaningful and achievable strategic vision and goals.	2
The prevalent culture largely derives from state mandated organisational structures.	Requires a sectoral understanding of the problem and a willingness at national level to influence change.	2
The existence of the divide between faculty and staff exacerbates the negative aspects of the organisational culture.	The existence of the divide needs to be recognised and understood by management if it is to be dealt with.	2
Management support is pivotal to the success of KM initiatives.	Management must understand their role in KM initiatives, from facilitation to participation.	1
The knowledge sharing environment must be adequately designed, resourced and supported.	The selection of an ESN platform should be given due consideration. vCoP terms of reference and generic blueprints should be established, and these should be bolstered by structured training.	1
For the ESN and vCoP to become established, the roles of community leaders and social media champions are very important.	Individuals in the organisation who exhibit the traits of community leaders and social media champions, should be identified, encouraged and incentivised to participate.	1
The knowledge sharing environment provides opportunities for mentoring and supporting new staff.	ESN and vCoP should be looked at by HR departments who are interested in the efficient assimilation of new staff into the organisation.	3
The terminology used to describe work-based social media tools can be problematic and inhibit many staff from using them.	Those implementing ESN should be cognisant of this and apply more community based terminology. ESN developers should investigate the introduction of alternative nomenclature.	2

One of the outcomes from the AR project was the development of a package of interventions to continue to grow the ESN user base and encourage the establishment of more communities, which is necessary to ensure the continuation of the practical element of the project. As these interventions provide some guidelines for the continued management of the knowledge sharing environment, they are reproduced here (Table 3), and include references to other guidelines such as those provided by Lave and Wenger (1991) for the development of CoP.

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Table 3. Package of Interventions for ESN/vCoP Management

No.	Intervention
1	Develop new terminology to replace ESN and 'social media'.
2	Expand communities' model to include communities of interest, communities of place (e.g. a campus community), and external communities.
3	Develop case studies of successful CoP to promote CoP model.
4	Establish metrics to determine the health and success of communities.
5	Develop a best practice guide for ESN users to help establish it as part of daily work routines.
6	Devise strategies to increase participation rates in CoP by moving members along the membership life cycle as per Lave and Wenger (1991).
7	Develop a role/job description for an Enterprise Community Manager.
8	Work with HR to develop the ESN for social on boarding and mentoring of new staff.
9	Investigate the use of Yammer as a teaching and learning tool for students in order to engage more academic staff.
10	Identify staff who see knowledge as a public good, with a view to becoming ESN ambassadors.

3.2.3 Limitations

The main limitation of this study was the time frame of the AR project. Due to the time constraints imposed by the DBA cycle, it was only possible to run the project over a 12 month period, from September 2015 to August 2016, coinciding with one academic year. According to Holtzblatt *et al.* (2013), adoption of new social software in organisations can be very slow, with interactions between users, changes in work practices, and the impact on business outcomes, all taking time to emerge. In order for these 'long-tail effects' to be realised, social communities must reach a critical mass, and the impacts are only seen in large populations over long periods of time. The problem is further exacerbated in this context by the nature of the academic year, with significant periods when faculty are largely absent from campus, including a three to four week period in December/January and an eight to twelve week period from June to August. This hampered progress during the initiation phase of the ESN, as the system was rapidly gaining users and showing increased levels of activity before a sudden decline in use, coinciding with the Christmas break. This was repeated at the end of the second semester with the advent of the summer recess, and this led to a more significant decline in use with the majority of faculty effectively ceasing all activity for three months. Notwithstanding the validity of the empirical testing of the Conceptual Model, the ability

to conduct a similar AR study over a period of two, or even three, academic years, would significantly enhance the results, and would allow for the introduction of more quantitative measures, informing a mixed methods approach.

The nature of the project was also somewhat affected by my changing roles during the development and implementation of the knowledge sharing environment. As IT Manager I was responsible for the selection and promotion of the ESN as a communications and collaboration tool for the organisation. As a member of the management team, I had considerable influence in persuading other managers to promote the use of the ESN and the communities' model amongst their staff. When I switched to a lecturing role, my ability to pursue this agenda was reduced, and this may have had an impact on the growth of the ESN in particular. However, the role change did have certain advantages for the data collection, as I was viewed differently by participants when I was in a non-management role.

A further limitation of this research may be the generalisability of the findings outside of LIT. LIT is the fourth largest IoT and the eleventh largest of the 21 public HEIs in Ireland[24], indicating that it is a valid representative sample to apply generalisability to the conclusions drawn from this study to the higher education sector in Ireland. Irish HEIs in general bear many similarities to HEIs in other jurisdictions, and indeed to other public sector organisations, and the findings may be of interest to the wider higher education community and other elements of the public sector. In addition, many aspects of the Conceptual Model may be applied to any organisation, including in the private sector, and a number of the related findings may be of interest to practitioners undertaking similar projects.

3.2.4 Further Research

The existence of a divide between faculty and other staff is not perceived equally by the two groups and further study is required to examine why this is the case. Much of the research to date into this phenomenon has been from a staff perspective (e.g. Conway and Dobson, 2003; Szekeres, 2004), and a different approach giving equal credence to both perspectives might yield more balanced results. Management and staff also have unequal perceptions of the importance of management support for the success of knowledge

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[24] HEA Statistics 2014-15: Available at http://www.hea.ie/node/1557

management initiatives, with staff perceiving it as being of far greater importance than management, and this warrants further investigation. The importance of the role of transformational leaders in HEIs and their impact on organisational culture change has been investigated in certain jurisdictions (e.g. Bryman, 2007; Basham, 2012). Further investigation in an Irish context would extend the body of knowledge on organisational culture in HEIs, and also serve as a useful comparator to the findings of this study. Notwithstanding the evidence for organisational structures and geographical dispersion in a multi-campus environment presenting as barriers to knowledge sharing, there is a perception that the development of a strong knowledge sharing environment can have a positive impact on organisational culture, helping to break down social divides and eliminate silos. Studying the further development and the ongoing activities of the ESN and vCoP will help to see how this can be achieved in practice. In addition, given the extended time-frame required for achieving critical mass with the implementation of any knowledge sharing environment using ESN tools, long-term studies are required to fully understand the implications of achieving strategic goals for knowledge sharing, both in terms of the derived benefits to both the organisation and individuals, and also for the culture of the organisation. The opportunities for further research are summarised in Table 4.

Table 4. Opportunities for Further Research

Conclusion	Opportunity for Further Research
The 12 month period of the AR project was limiting, particularly in the HEI context.	A longtitudinal AR study design, over two or three academic years, investigating similar themes.
The divide between faculty and staff is not equally perceived by both groups.	A balanced study approach could extend the knowledge in this area, with impacts for the management of HEIs.
The importance of management support for KM initiatives has unequal perceptions amongst management and staff.	A study across a number of organisations in both the public and private sectors could add to the understanding of the success of KM initiatives.
The role of transformational leaders in HEIs and their ability to deliver culture change is not widely recognised.	Research examining the prevalent culture in HEIs, and its relationship with leadership types, would be useful for informing long-term HEI strategies.
The organisational and individual benefits derived from having a knowledge sharing culture are not well understood, and often vaguely stated.	Long term, mixed-methods studies to determine the organisational benefits of ESN and vCoP adoption, and the individual benefits of participation, are required.

3.2.5 Concluding Remarks

There is a growing awareness amongst practitioners and researchers that the implementation of social media in organisations has given a new impetus to KM. However, limited research has been conducted on applications of social media for organisational knowledge sharing, and especially in higher education contexts. In examining how ESN tools can enable staff knowledge sharing in vCoP in a HEI, this research has produced a number of findings informing both theory and practice, and which can be used as a basis for further research. In general, the study findings provide an opportunity for educationalists to better understand the scope and the impact of employing ESN platforms for knowledge sharing. In seeking to determine the drivers and barriers to sustainable use, this research should also be of interest to practitioners and researchers undertaking similar projects.

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Section 4

REFLECTIVE LOG - EXTRACTS

4.0 Introduction

The importance of reflection to the learning process of the DBA is highlighted by its emphasis in five of the 11 learning outcomes for the programme, which are presented in the DBA Programme Handbook (p.4).

7. ***Reflect*** on mastery of the skills of research manuscript preparation and delivery by actively engaging in a cycle of research manuscript publication.

8. Develop personal competencies through a process of ***self-reflection*** and the engagement of personal creative practice, individual leader proficiency, and ethical reasoning.

9. Lead and initiate critical evaluations of the study, and independently and ***competently reflect,*** analyse, challenge, and theorise on new and existing business knowledge.

10. ***Critically reflect*** on the role of manager and change agent by challenging and evaluating new and existing theories and practices and bringing original and relevant scholarship to bear on business and/or management contexts.

11. Engage in ***reflective observation*** and the stimulation and leadership of workplace change and learning across different business and organisational contexts.

In order to facilitate the process of reflection, it is recommended that the researcher maintains a reflective log for the duration of the DBA programme. The log also serves to underpin the dual roles of practitioner and researcher that are encountered during the programme. The value of maintaining a reflective log whilst undertaking research is highlighted by a number of authors. For example, Jasper (2005, p.257) argues that reflective writing is central to the research process and "should be considered as central to establishing the trustworthiness of a qualitative study". McNiff and Whitehead (2009) describe some of the useful functions of keeping a diary, including using it as an analytic tool where data can be recorded and examined, and using it as a reflective tool where the researcher can develop their interpretations. Many definitions have been attributed to the concept of reflection, so it is useful to select a working definition for it. Moon (1999) defines reflection as a form of mental processing applied to relatively complicated and poorly structured ideas in order to pursue a solution to a problem presented by these, and, according to Fulton *et al.* (2013), it involves careful and deep analysis of events. A deeper state of reflection is known as reflexivity, and this requires a researcher having the self-

awareness to move outside of their own values and biases so that they can act in the full knowledge of why they are doing something. Some added advantages of reflexivity over reflection are proposed by Lee (2009), such as giving attention to the researcher's own role in the production of knowledge, and examining their own role in the production of data. This distinction became particularly important for me once I had selected AR as my research approach. According to Coghlan and Brannick (2014), one of the central components of conducting AR is the maintenance of a reflective log, and over the course of the AR project, and particularly during the data collection, my thoughts became more reflexive as I attempted to remove myself from the process as much as possible in order to minimise bias in my observations. I ended up with two reflective journals, one for reflecting on the AR process, and one to fulfil the requirements of the DBA programme. There were periods when I really only used one of these extensively, such as during the implementation of the AR cycles, and I attempted to capture the dual aspects of practice and research in one place. What follows is a brief chronological description of my research journey with selected excerpts from both of my reflective journals inserted as appropriate.

4.1 The Research Journey

I started my reflective log on the first day of the DBA programme in June 2013 and maintained regular entries in it until completion of the thesis in April 2017. The early entries could not even be described as reflections, rather they are merely descriptions of what I was doing at particular times, including notes from reading literature and attempts to develop research objectives. As I engaged more with the literature, my notes became more reflective and began to explore some of the themes in a more critical fashion. For example:

> According to Petrides and Nodine (2003), "the more people share information, the more each of them gains; knowledge is created by the intersection of experience with information." This implies that the environment that enables information sharing must be created, but left to its own devices this simply will not happen – it needs to be driven by some division of the organisation. Responsibility for it must lie somewhere. The logical place is within IT services and ultimately with the CIO, who must be at the executive level. This is one of the few positions in the organisation that has awareness of the organisations information culture and politics.

This was an early observation but gives an indication of my developing thought processes as I searched for ways to improve knowledge sharing without knowing very much about it.

I found an early note in my journal describing feedback analysis techniques from Drucker (1999):

> When you make a decision or take action, write down what you expect the outcome to be. Review this nine or twelve months later and compare against the actual outcome. This will show where your strengths lie over that period.

Looking back at some of my notes and reflections at a remove of two or three years, gives me a clear indication of what I have learned from the research process and where my strengths have developed. A simple example of this is in my ability to read research papers. I found this very difficult at first and considered some of the papers that I was reading to be poorly written, with myriads of long and cumbersome sentences. I needed to go over them a number of times to extract the salient points. I now realise that this is probably not to do with the manner in which the papers are written at all, but more to do with my knowledge of the subject matter. As I became more expert in the theory bases that I was exploring, the material became much easier to assimilate and now I can absorb papers in a fraction of the time than I could at the beginning.

The reflective process helped me through some periods where I might have otherwise given up on the DBA altogether. For example, I was required to submit a paper on research philosophy and research methods in July 2014. I really struggled with the whole concept of working out a philosophical stance for the research, and indeed even failed to understand the need to do so. I have applied my engineering training throughout my working life and take a logical approach to everything. It took me a long time to work out that this is simply looking at things from a pragmatic perspective. Combining pragmatism with critical realism seemed like a logical stance for me to take as it allows me to acknowledge my place within the research and the impact that that might have on the results. From this, I determined that an AR strategy, comprising of a longitudinal case study, would be the most appropriate one to adopt. I felt that the paper was reasonably strong and set out good arguments for my intended positions. However, I felt that the feedback was overwhelmingly negative and it seemed to me like the paper was torn to shreds. I had received fairly positive feedback for the first paper, so this came as a shock by comparison. I suppose that I am not used to criticism of my work at that level and I

found it difficult to cope with. In fact, that feedback almost completely derailed me and I really questioned both why I was doing the DBA at all and if I had the ability to do it. I came very close to pulling out of the programme and only stayed following a conversation with a colleague who is on the previous cohort and had been through similar dark moments. Some of my notes from this period reflect this negativity and it took some time to work though it and get back on track. I made a concerted effort to focus on what I had achieved to date and reflected on the research journey to that point:

> I find it interesting that the research questions that I am developing now, were in fact emerging from some of the earliest literature that I was reading, but that it has taken until now for me to recognise what I was looking for. I have learned other things, such as I seem to work much better in blocks where I can devote significant amounts of time to the research together, rather than 10 or 15 hours a week, comprised of a couple of hours here and there. I have learned that the criticism of my work should not be taken personally and that, if I am to survive and complete this programme, any criticism should be looked upon as helpful and I have to try and understand it from the reviewers view point.

The remainder of the DBA programme followed the development of the Research Paper series. Most of my reflections during the production of the Conceptual and Methodology papers are concerned with my readings for these papers. The Conceptual Paper is the equivalent of a Literature Review and involved assimilating material from hundreds of papers across different theory bases. The development of the Methodology paper was similar as I researched the aspects of research philosophy and design that I needed to consider. For example, I reflected extensively on the suitability of AR as my preferred research technique before I was fully convinced that it was the most appropriate approach to take. I was particularly convinced after reflecting on a description of AR from Koshy *et al.* (2010):

> AR involves practitioners conducting systematic enquiries in order to help them improve their own practices, which in turn can enhance the working environment. Its strength lies in its focus on generating solutions to practical problems and its ability to empower practitioners by getting them to engage with research and the subsequent development or implementation activities. It involves ACTION, EVALUATION and CRITICAL REFLECTION, and implements changes in practice based on gathered evidence. Action researchers tend to be practical and concerned with achieving real outcomes with real people.

The development of the Methodology paper in particular caused me to investigate the process of reflective journaling more closely. I was aware that it is considered to be a

significant component of conducting AR projects but I did not give it enough consideration in the paper. This was picked up by the examiners, who stated:

> The pivotal role of reflection/reflexivity in action research phases and cycles is not prominent in the methodology presented here. The author recognises observation intrusion which needs to be dealt more specifically under reflection/reflexivity – a diary gets a brief mention at the end of the paper.

As a result of this, I read a number of papers on reflective methods and journaling (e.g. Scanlan *et al.*, 2002; Jasper, 2005), and decided that I needed to find a method for reflection for the AR project, and I adopted a reflective cycle developed by Gibbs (1988). I found this to map fairly well to the AR stages that I had adapted from Susman and Evered (1978) for my research model, as it included stages called *Description*, *Feelings*, *Evaluation*, *Analysis*, *Conclusion* and *Action Plan.* This reflection cycle helped me to improve my reflective techniques and it was through using this that I felt that I moved towards reflexivity in much of my analysis.

Prior to commencing the AR project, I was required to make an application to the LIT Ethics Committee for approval. My first application was refused and my initial reflection on this was unhelpful, if not understandable:

> The refusal of my application by the LIT Ethics Committee was a major surprise. They produced a list of queries that indicated that the paid little intention to the submitted documentation. You'd swear I was doing experiments on people or interrogating children, the way they carry on. There are so many obstacles put in place to doing research, it's a wonder there's any done at all.

However, it was by re-reading this entry some days later and applying the reflective cycle to it, that I was able to recognise the value in recording my initial feelings. I was then able to properly evaluate and analysis the situation, which forced me to ask what else I could have done and develop an action plan. This resulted in the production of a full ethical framework for the research which ultimately became a significant guide in conducting the data collection.

From this point, most of my reflections are concerned with the AR project and my research reflections largely merged with these. Reflecting sometimes became an almost automatic and subconscious activity and I found that I could do much of it on the go without sitting down whenever I could to maintain the reflective journal. I found that I had to be disciplined in order to keep making journal entries, and the value of this is
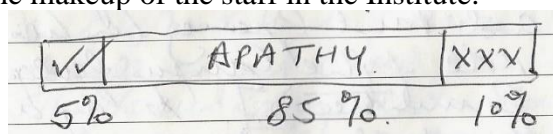
evident when writing up the research. I have provided some examples of the journal entries that relate to the AR project to illustrate how I used the process to record my feelings, work though problems and develop new ideas.

> X is leading a sub-committee of the Academic Council, but is of the opinion that it is a waste of time and effort, and that the vCoP might be of significantly more benefit. I wonder how many more people out there are thinking like that. It was precisely that frustration in dealing with these groups that led me to develop this initiative.

> X was the first to respond to the first email and is very enthusiastic about the project, going so far as suggesting a number of possible communities. Y mentioned that he (X) is a very poor communicator (although he described him as a genius) but an excellent writer, with a number of blogs going at any one time. Y thought that the ESN would be an ideal environment for him (X) because it forces him to write his thoughts down. Everyone gets frustrated with him at meetings because he rambles – the ESN might get the most out of him. This might apply further to 'academic conversations' where faculty can often be trying to outdo each other and meeting become egotistical battles where nothings gets achieved. Taking it into a virtual environment where they have to write should make academic conversations much more productive.

> X from (named academic department) invited two of his colleagues to join the (named vCoP), and in his message to them he said: "I've found this (named vCoP). You might both like to join to get a bit of (named academic department) presence. We might get access to their (named facility) which I expect would be better equipped than ours – but that's possibly wishful thinking. If anything else we might pick up some nice teaching lab/ideas." This demonstrates exactly why vCoP are needed – look at the mistrust here between two academic departments in the same faculty! It speaks volumes for the divisions in LIT. Why can't be have two state-of-the-art facilities in the faculty, available for both departments to use?

> There seems to be a small number of very interested parties at one end of the spectrum, a larger number of staff who are very opposed to trying anything like this, and general apathy towards it in the middle. It is probably a fair reflection of the makeup of the staff in the Institute:

> The trick will be to shift numbers from the APATHY lot into the enthusiastic lot. The big question really is how to achieve this. What will incentivise staff to join CoP and use Yammer?

Most of the entries in the journals after the conclusion of the AR study are concerned with the development of the introduction, discussion and prefaces for research papers, and inform much of what appears in those sections.

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Appendices

Appendix 1 – Publications

1. **The 18th Irish Academy of Management Conference (IAM 2015)**

   3rd – 4th September 2015, NUI Galway, Ireland.

   An Evaluation of Using Social Media for Knowledge Management in Higher Education Contexts: A Conceptual Review

2. **The 3rd European Conference on Social Media Research (ECSM 2016)**

   12th – 13th July 2016, Ecole de Management de Normandie, Caen, France.

   Using Enterprise Social Networks to Support Staff Knowledge Sharing in Higher Education

3. **The 17th European Conference on Knowledge Management (ECKM 2016)**

   1st – 2nd September 2016, The University of Ulster, Belfast, Northern Ireland.

   Using Enterprise Social Networks as a Knowledge Management Tool in Higher Education

   International Association of Knowledge Management (IAKM) Papers Award Competition: Runner-Up.

Reviewer Comments:

This paper considers the role of KM in Higher Education Institutions with specific interest awarded to Virtual Communities of Practice. The abstract and keywords adequately capture the content of the paper. The literature review contains a number of key references relevant to the KM field. Both seminal and recent sources are considered. Contextual information is provided with rationale included to support the selection of Action Research as a suitable research method, figure 1 presents the approach selected. The paper states: 'The conceptual model was developed from the research questions' however at this stage of writing RQs have not yet been presented. Figure 2, the conceptual model, offers detail on the area under investigation however it is unclear from where the attributes of the model have been derived – perhaps a table could be added to list key literature, authors and findings that link to the conceptual model elements. Is 'the theoretical framework' the same as the conceptual model? The paper claims 'A selection of different ESN tools was evaluated, including social media tools, wikis, blogs and mail groups, against a number of criteria such as cost, usability, support and training requirements' however no evidence of this evaluation is included. Instead the paper discusses the use of Yammer – no reasons for choice of system application are provided. It is unclear how the system was used and why? Focus group discussion are presented as evidence for system use but I feel the paper falls flat at this stage. I am not sure what is being analysed, the rigour of that process, the

findings or the impact. The author needs to clarify what is happening and why and to what effect. The paper is well presented and easy to read (if the content is somewhat confusing due to lack of detail as outlined in the previous commentary). The conclusion promises two further stages of investigation, the author needs to clearly show at the beginning of the paper the contributions this paper is making and how it links to the overall research methodology.

4. The 19th Irish Academy of Management Conference (IAM 2016)

31st August – 2nd September 2016, UCD Smurfit Graduate Business School, Dublin, Ireland.

Examining Ethics for an Action Research Project in an Enterprise Social Network Enabled Virtual Communities of Practice Environment

5. The 28th SPACE Network Conference 2017

26th – 28th April 2017, ISCAP Accounting and Business School, Porto, Portugal.

Management Support for Staff Knowledge Sharing in Higher Education Institutions

Reviewer Comments:

Very well written paper (in English); Literature review very well developed; Research Design and Methodology well justified. Some issues: Susman and Evered (1978) seems to be a very old model. Aren't there any other developments to this model or other more recent models? "The findings from this study are generalizable to the wider higher education community" – some doubts about this – please expand.

6. The 16th European Conference on Research Methodology for Business and Management Studies (ECRM 2017)

22nd – 23rd June 2017, Dublin Institute of Technology (DIT), Dublin, Ireland.

Evaluating an Action Research Design for an Information Systems Study

Reviewer Comments:

This is an excellent paper on a subject – the application of Action research methods in IS research projects, highly relevant to the conference. It is well written with a high standard of English and very well structured. The references on using AR in IS are comprehensive. The paper assesses the suitability of AR methods for IS research in the HE sector through a review of the relevant literature, a discussion of the problems associated with this research method with respect to the special conditions of HE (for example that researchers are usually also the client) and an explanation of how these problems were addressed for a specific IS research project in HEI. The research project involves

supporting the development of a vCoP environment within an HEI by use of ESN tools (specifically yammer). The complexity of data collection when pursuing both the practical objective (developing the use of yammer) and the research objective (evaluating the conceptual model) are very well presented. Perhaps when the authors have greater space it would enhance the paper to have more detail on the evaluation of how the data was used to evaluate both the practical results (the spread and use of yammer) and the conceptual model.

7. The 4th European Conference on Social Media Research (ECSM 2017)

3rd – 4th July 2017, Mykolas Romeris University, Vilnius, Lithuania.

Using Enterprise Social Networks to Support Staff Knowledge Sharing in Higher Education

Reviewer Comments:

Good quality paper. It will contribute to the Conference. The sample used by author is based on one enterprise only. It would be much more interesting to compare the results with other entity. The results would be more useful if the comparative study was possible.

8. The 20th Irish Academy of Management Conference (IAM 2017)

30th August – 1st September 2017, Queen's University, Belfast, Northern Ireland.

The Impact of Organisational Culture on using Enterprise Social Networks for Staff Knowledge Sharing in Higher Education.

Reviewer 1 Comments:

This is an interesting study exploring the use of social media for knowledge sharing within universities. The findings identify a number of factors which mediate the use of social mediate knowledge sharing. These factors have potential implications for both theory and practice which I look forward to reading more about in the full paper/presentation.

Reviewer 2 Comments:

Interesting study and will be of interest to the IAM audience. Difficult to give any constructive comments given the abstract word count is so tight. Appropriate methodology given focus on culture and CoP. Look forward to reading the full paper.

9. The 18th European Conference on Knowledge Management (ECKM 2017)

7th – 8th September 2017, Universitat, Internacional de Catalunya, Barcelona, Spain.

The Impact of Organisational Culture on Staff Knowledge Sharing in Higher Education

Reviewer Comments:

I really appreciate reading the paper. The subject is very important and addresses an interesting gap. There is a great contribution on the academic and empirical field. I suggest that the authors give more details about the data description and discussion. I also recommend the authors make clear the contribution of the paper in the conclusion section.

10. VINE Journal of Information and Knowledge Management Systems: Volume 47, Issue 3 (2017)

Using Enterprise Social Networks as a Knowledge Management Tool in Higher Education

Reviewer 1 Comments:

Dear Authors - You did a good job. I am only concerned that you might develop your sections 4 and 5 and include Discussion section in the middle. So: 4 Findings 5 Discussion 6 Conclusions. Because you ground your research very well, you implement it very well also and I believe you may develop the last sections to make a really remarkable paper. I leave the decision open to you and to the editor. The paper is publishable but could be improved. Findings could be related to the various arrows and boxes in figure 3. Discussion should compare your findings with literature and indicate implications for practitioners and academics. Conclusions should list the main findings in a short paragraph and list ideas to future research. Well done.

It an interesting piece of work linking action research to knowledge management. Well done well thought and well grounded. And finely written. Almost too many references, if this is possible. Compared with the other sections the results section is small. May be the authors could enlarge it and provide more details but what is shown is clear and important.

Reviewer 2 Comments:

Good paper and interesting. I suggest that just a little revision is made before publication. The paper combines elements that are known in the literature, but in a fresh way. What I find original is their integration and application to investigate a specific but important topic (i.e. use of virtual communities and social media to help knowledge sharing in HEIs). I would say that literature sources are even too many. The list of references is pretty long, and maybe the authors can decide to cross out some. The methodology is appropriate for the kind of study. Maybe, the authors can add some details that can help a reader to contextualize the research, i.e.: time (when was it conducted?), people involved, institution involved, etc. If they need to anonymize something, this should be declared. Also, figure 3 reports a time graph, but there is no year there, just months (and axes should be tagged as well). The

results are clear enough, but presentation may be improved. For example, maybe the authors can use a synoptic table that summarize the main results (and that can be placed in the "findings" section or in the "conclusion". For example (but this is just an idea, the authors will see): what about duplicating table 1 but replacing the "source" column with specific comments or notes that result from the investigation? For example, in row 1 "antecedents for knowledge sharing - convenient environment" the authors can say what they found in the research that can provide information about this point. And the same for the rest of the table. I would expect to see a "limitations" section in the conclusion. Sections are quite long and sometimes difficult to read. Maybe the authors can divide long sections into subsections. There are many acronyms, see if some can be left out.